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DISEASES CAUSED BY BACTERIA AND FUNGI.

LIONNET, F. E. (1934). Avortement contagieux d'origine streptococcique chez des vaches laitières de l'Ile Maurice. [**Streptococcal Contagious Abortion in Cows in Mauritius**].—*Rec. Méd. vét.* **110.** 394-397. 1 table, 1 chart.

In a dairy herd where abortion was occurring annually in a large number of animals free from brucella infection, the cause was found to be a streptococcus of the *viridans* type. Vaccination with cultures prepared according to Besredka's method proved effective in combating the disease.—S. J. EDWARDS.

DAVIES, G. O. (1935). "**Actinomycotic**" **Mastitis.** [*Staph. pyogenes*].—*Vet. Rec.* **15.** 15-17. 3 figs. [6 refs.]

Although the term " actinomycotic " mastitis has been commonly used, the author could find no record of the recovery of *Actinomyces bovis* from a lesion in the udder of a cow. Staphylococci have been responsible, with rare exceptions, for the 170 recorded cases.

The author describes in detail the first British record of this condition, occurring in an imported Canadian cow. A pure culture of *S. pyogenes* was obtained from several sites in the lesion. It is contended that the term " actinomycosis " is a misnomer in this case, as it is also in " wooden-tongue " of cattle. A plea is made for the naming of the actinomycotic conditions according to their aetiology, and the author suggests " actinomycosis " for conditions due to *A. bovis*, " actinobacillosis " where *Actinobacillus lignieresi* is responsible and " actinococcosis " where *S. pyogenes* is the aetiological agent.—R. F. MONTGOMERIE.

I. BEHNKE. (1934). Ueber Veränderungen der Milzbrandbazillen beim örtlichen Schweinemilzbrand. [**Changes in** *Bacillus anthracis* **after Localized Anthrax in Swine**].—*Dtsch. tierärztl. Wschr.* **42.** 365-366. 3 figs.

II. GHEORGHIU, I. (1934). Sur le dégénération d'une souche de bactéridie charbonneuse. [**Degeneration of a Strain of** *B. anthracis*].—*C. R. Soc. Biol. Paris.* **116.** 465-466.

III. VERGE, J., & PLACIDI, L. (1934). Le charbon expérimental du Chien et du Chat. [**Experimental** *B. anthracis* **Infection in the Dog and Cat**].—*Ibid.* 720-721. [1 ref.]

I. In the necrotic lymphatic glands of pigs affected with anthrax, the author has found that *B. anthracis* is usually present in a state of degeneration, being very

short and without a capsule. Occasionally, however, involution forms were observed where the bacillus was greatly swollen with an intensely stained capsule.

II. The author recovered a strain of *B. anthracis* from a case of anthrax in a horse. This strain, freshly isolated, was virulent for the rabbit. After repeated subcultures on agar, the strain gradually lost its virulence and changed its biological characters.

III. Dogs and cats were shown to be susceptible to anthrax when sufficient culture was injected by the intradermal, intravenous or intratesticular routes. The susceptibility of the dog was greatly increased when the animal had been subjected to a period of fasting.—S. J. EDWARDS.

HRUSKA, K. (1933). Die Rolle der Glukoside bei der Impfung mit virulenten Bakterien. Milzbrandglukosidkultur. II. Mitteilung. **[Role of Glucosides in Vaccination with Virulent Bacteria. Anthrax. Part II].**—*Z. ImmunForsch.* **81.** 367-376. 8 tables. [7 refs.]

In this further report on the value of anthrax vaccines prepared by treating the second Pasteurian vaccine strain cultivated on agar with solutions of the glucosides, saponin or digitonin, Hruska details certain representative experiments made on rabbits. The effects of various concentrations of glucoside for periods of one to 30 days on the safety and immunizing power of the vaccine were tested. The minimal concentration of digitonin lay between one and four parts per 1,000 and that of saponin between five and 50 parts per 1,000. The results varied somewhat but, in general, vaccines prepared with the lower concentrations for short periods were less safe, but more efficient as immunizing agents. Most animals were protected against the second Pasteurian strain but only about half against a smaller dose of a fully virulent strain. For details, the original must be consulted.

The two glucosides used together in minimal concentrations enhanced each other's activity and less local reaction was produced than with higher concentrations of either alone.

The author notes that 35,000 cattle have been inoculated twice, with an interval of three months, with glucoside vaccine and that in no case has vaccination anthrax followed.—A. W. STABLEFORTH.

I. DOUGLAS, A. (1934). **The Eradication of Tuberculosis.**—*Vet. Rec.* **14.** 1079-1100.

II. —. (1934). **Bovine Tuberculosis. Complete Eradication as a Settled Objective. A Review.**—*Ibid.* 1100-1103.

I. The author puts forward a system aiming at the eradication of bovine tuberculosis in cattle, with special reference to the conditions in Ayrshire, Scotland. This, with the lengthy discussion which followed (at the Congress of the National Veterinary Medical Association of Great Britain), does not lend itself to abstraction.

Tuberculin testing, segregation and a clean herd building scheme were advocated.

II. An editorial referring to I and to the report of the Economic Advisory Council Committee on Cattle Diseases [see p. 389].—J. E.

CORNELL, R. L. (1934). **The Incidence of Tuberculosis among Cattle belonging to the Wachagga Tribe in Tanganyika Territory (E. Africa).**—*J. comp. Path.* **47.** 320-329. 2 figs., 3 tables. [6 refs.]

Cornell applied the double intradermal tuberculin test to 441 cattle belonging to the Wachagga tribe in Tanganyika. It is the practice in this tribe to confine

the cattle throughout their lives in the same huts in which the owner and his family sleep. The incidence of human tuberculosis in the tribe is high.

The tests showed eight (1·8 per cent.) positive, 19 (4·3 per cent.) doubtful, and 414 (93·8 per cent.) negative animals. The principal tests were made with synthetic tuberculin, but comparative tests with glycerin-broth tuberculin were made on four positive reacting animals and on one doubtful reactor.

Four positive animals and the doubtful one were killed and autopsies carried out. No lesions of tuberculosis were found, and guinea pigs inoculated with suspensions of lymphatic glands remained healthy.

Cornell discusses the susceptibility of zebu cattle to tuberculosis, and the possibility in the present instance of contamination with tubercle bacilli of the human type.—T. M. Doyle.

Rautmann, H. (1934). 30 Jahre Rindertuberkulosebekämpfung in der Provinz Sachsen mit besonderer Berücksichtigung der Tuberkulosestatistik für das Jahr 1932. [**Thirty Years' Control of Bovine Tuberculosis in Saxony with Statistics for 1932**].—*Dtsch. tierärztl. Wschr.* **42.** 369-373 and 386-391. 2 figs., 6 tables. [5 refs.]

The number of cattle examined for tuberculosis in Saxony has risen from 1,457 in 1903 to 231,973 in 1933. Except for the period covered by the war, this represents a steady increase. The percentages of cattle examined in 1932 in each district are tabulated, together with percentages found to be tuberculous, which in most cases lie between one and five. For the whole of Saxony, 2·08 per cent. of all cattle examined proved to be tuberculous. When 33,368 herds were grouped according to the number of cattle in each herd, it appeared that 10 per cent. of herds containing ten or fewer animals were infected and 66 per cent. of herds containing 25 to 50 animals were infected. Of the whole series, 14 per cent. contained tuberculous animals. [This figure corresponds fairly closely to that of the more heavily infected counties in England]. About 33 per cent. of suspected animals proved to have open lesions of tuberculosis. The cost of the eradication campaign is discussed.—E. J. Pullinger.

Stevens, W. S. (1934). **A Plea for Intensive Action against Bovine Tuberculosis.** —*Vet. Rec.* **14.** 1260-1262.

The author surveys in this paper, presented to the Veterinary Hygiene Section, Health Congress, Royal Sanitary Institute, Bristol, the common methods by which tuberculosis is disseminated among bovines. He recognizes that the methods practised for the eradication of the disease in certain overseas countries are not applicable in their entirety to the somewhat different farming conditions obtaining in Great Britain. He considers that the American plan for the eradication of the disease from specified areas would not be a suitable procedure in this country, but nevertheless he puts forward a " territorial plan " which differs only from the United States " accredited area " scheme in name.

In the author's special areas a six-year plan, divided into three periods each of two years, would be practised. During the first period clinical examination of the cattle and microscopical examination of the milk would be undertaken. The second period would be devoted to tuberculin testing and the eradication of reactors. During the third period all milk not the product of tuberculin-tested cows would be prohibited for human consumption.

[A scheme aiming at the gradual eradication of bovine tuberculosis in Great Britain is now being practised under the control of the Ministry of Agriculture]. —T. M. Doyle.

WEIR, J. (1935). **An Experience with Tuberculin in the Treatment of Bovine Pneumonia.**—*Vet. Rec.* **15.** 17-18.

A newly-calved heifer, suffering from severe and apparently fatal pulmonary disease, was submitted simultaneously to the intradermal and intrapalpebral tuberculin tests. Two days later there were no reactions, but a marked improvement was noted in the animal and continued until recovery was complete, unaided by other treatment. Eight similar cases have been experienced. One of these animals developed another attack of pneumonia 12 months later and was slaughtered. *Post-mortem* examination showed extensive pneumonia, from which *Bact. coli* was isolated. A small, active, pea-like nodule of tuberculosis was noted in the lungs and another in the mediastinal gland, which, it was concluded, had developed after the tuberculin test.—H. E. BYWATER.

BONGERT, J. (1934). Ist das Friedmannsche Mittel ein spezifisches Tuberkulose-Heil- und Schutzmittel und von überragender Wirkung gegenüber anderen Heilmethoden ? **[Value of Friedmann's Remedy against Tuberculosis].**—*Arch. wiss. prakt. Tierheilk.* **67.** 459-488. [29 refs.]

It is concluded that Friedmann's preparation [this *Bull.* **1.** 268.] has no specific protective or curative action against tuberculosis. It exerted no protective action against tuberculosis inhalation infection in white rats, these animals being normally resistant to the disease and only infected by inhalation. No inactivation or healing followed subcutaneous injection in tuberculous rats and guinea pigs.

—E. J. PULLINGER.

GUGUEN, A. (1934). Contribution à l'étude du B.C.G. Son innocuité chez le chien. **[A Study of BCG. Its Innocuity for the Dog].**—*Thesis for Docteur vétérinaire, Alfort.* pp. 87. 7 charts. [55 refs.]

The author has made a study of canine tuberculosis and carried out a series of inoculations to determine the effect of BCG vaccine on dogs. The vaccine produced no visible lesions up to a period of observation of five months. The passage of BCG through dogs did not confer any virulence on it for guinea pigs.

It has been estimated [LESBOUYRIES] that about 8 per cent. of dogs in French towns are infected with tuberculosis.—T. M. DOYLE.

HAUTCOEUR, P. (1934). Essai de prophylaxie de la tuberculose bovine par le B.C.G. dans une exploitation de l'arrondissement de Cambrai. **[Preventive Inoculation of Cattle with BCG].**—*Thesis for Docteur vétérinaire, Alfort.* pp. 78. 2 plates.

Hautcoeur tested the protective value of BCG vaccine on a herd heavily infected with tuberculosis in the north of France. The experiment has been in progress for the past ten years.

All calves received a subcutaneous injection of vaccine (50 mg.) within 21 days of birth, and a similar dose each successive year. Strict isolation of the calves during the first month was not practised, and all the milk used for feeding them was not apparently from non-reacting cows.

The results obtained were satisfactory, and the annual financial loss, that had occurred previous to the use of vaccine, completely disappeared.

Since the inception of the tests, 427 animals have been vaccinated, and only two cases of tuberculosis have occurred ; these were in calves aged six and nine months respectively, and the lesions were confined to the retropharyngeal lymphatic glands.

During the same period, seven cases of tuberculosis were found among unvaccinated animals, in three of which the disease was generalized.

—T. M. Doyle.

de Kock, G. (1934). **Bovine Tuberculosis in its Relation to Public Health.**—*S. Afr. med. J.* **8.** 640-648. 5 tables.

Tuberculin tests, carried out throughout the Union of South Africa since 1929, have shown 5 per cent. of positive reactors but, in the campaign against tuberculosis in Durban, 39 per cent. of dairy cows reacted positively. The author discusses the most recent views on the tuberculosis problem in human beings and the domesticated animals, including modern methods of control. Various points in connection with the so-called " no visible lesion " reactor are discussed and the various articles on the subject are reviewed. de Kock lays stress on the necessity for propaganda amongst cattle owners to make them realize the serious nature of the tuberculosis problem.—E. M. Robinson.

Hämel, J. (1934). Rindertuberkelbazillen als Erreger eines Lupus vulgaris und einer gleichzeitig bestehenden Lungen-tuberkulose. [**Bovine Strain of** *Mycobact. tuberculosis* **as the Cause of Lupus Vulgaris and a Simultaneous Tuberculosis of the Lungs**].—*Med. Klinik.* **30.** 328-330. [5 refs.]

The details are recorded of a case of tuberculosis of the lungs and lupus occurring in an 18-year-old girl. The causal organism was shown to be of bovine type. By reviewing the literature, it appears that, in Germany, 10 per cent. of cases of lupus are due to the bovine type of tubercle bacillus, whilst about 0·5 per cent. of the cases of tuberculosis of the lungs are due to the bovine type.

—R. Lovell.

Helm, R. (1934). Die Empfänglichkeit des Meerschweinchens für Geflügeltuberkulose. [**Susceptibility of Guinea Pigs to Avian Tuberculosis**].—*Dtsch. tierärztl. Wschr.* **42.** 733-736. 1 table. [8 refs.]

The author gives the results of further work done on the susceptibility of guinea pigs to the avian type of *Mycobact. tuberculosis* [see this *Bull.* **4.** 8.] in which he found 14 of 25 avian strains pathogenic for guinea pigs.

In the work now reported, four strains of avian type were used and 50 guinea pigs were inoculated subcutaneously and 50 intraperitoneally with each strain. The period of observation of the inoculated animals was carried on over ten months, and 135 animals were killed. Records are given of the variation in weight, tuberculin tests, *post-mortem* findings and bacteriological examination. These reveal that the injection of avian tubercle bacilli, both by the subcutaneous and intraperitoneal routes, succeeded, in many cases, in causing infection. Macroscopically, pathological changes were, as a rule, found in the lungs, liver and spleen. From these organs, and from the bone-marrow and site of subcutaneous injection, it was again possible to isolate the organism by cultural methods, using Petragnani's nutrient media. Histologically, a localized, large-celled hyperplasia was found in the affected parts of the organ. Giant cells were not identified. On the other hand, foci of epithelioid cells were scattered in the tissues. Tubercle bacilli were found in clumps, by careful examination of the section. The tuberculin test gave indefinite results. Contact infection was proved.

Helm's experiments show that the guinea pig is not suited for the differentiation of avian and mammalian tubercle bacilli.—C. R. Turbet.

MADDOCK, E. C. G. (1933). **Studies on the Survival Time of the Bovine Tubercle Bacillus in Soil, Soil and Dung, in Dung and on Grass, with Experiments on the Preliminary Treatment of Infected Organic Matter and the Cultivation of the Organism.**—*J. Hyg., Camb.* **33.** 103-117. 5 tables. [3 refs.]

The author carried out experiments to ascertain (1) the length of survival of bovine tubercle bacilli in (a) manure, (b) manure and soil, (c) soil, and (d) on growing grass, and (2) the interval after infection before pastures become non-infective.

It was found that the maximum period of survival of virulent tubercle bacilli in soil, soil and manure mixture, and manure was about six months. It was concluded that exposure for a period of seven months would be sufficient to kill tubercle bacilli under these conditions.

Bovine tubercle bacilli were shown to be capable of surviving on growing grass for at least 49 days in summer in England.—T. M. DOYLE.

CORPER, H. J., & VIDAL, C. B. (1933). **The Inhibitory Effect of Normal Blood on the Growth of Tubercle Bacilli at Incubator-Temperature.**—*Amer. Rev. Tuberc.* **28.** 878-883. 1 table. [8 refs.]

The authors have shown experimentally that the growth of human and bovine strains of tubercle bacilli on suitable media is inhibited by normal blood from dogs and rabbits. This inhibition is more pronounced when small numbers of bacilli are present, and is better observed on inspissated egg-yolk medium than on potato. It is the result of the development of toxic autolytic products from normal blood, and it does not occur when the blood has been treated with one or two volumes of 6 per cent. sulphuric acid for 30 to 60 minutes at 37°C.

—T. M. DOYLE.

SPIELMAN, M. A. (1934). **The Chemistry of the Lipids of Tubercle Bacilli. XXXIX. The Constitution of Tuberculostearic Acid.**—*J. biol. Chem.* **106.** 87-96. 1 table. [21 refs.]

Tuberculostearic acid, the simplest of the saturated liquid fatty acids of unknown constitution that have been isolated from various lipid fractions of tubercle bacilli, has been purified. Its empirical formula is $C_{19}H_{38}O_2$, and it appears to be a 10-methylstearic acid. It differs slightly from synthetic 10-methylstearic acid. The acid is physiologically inactive.—W. R. WOOLDRIDGE.

COOPER, F. B. (1934). **The Filtrability of the Acid-Fast Group.**—*J. infect. Dis.* **54.** 236-249. [42 refs.]

The author briefly surveys the literature dealing with the filtrability of the acid-fast group of bacteria and discusses the methods and the media employed by different workers for obtaining growth from filtrates. He carried out a series of experiments with the object of assessing the value of some of the latest methods of technique recommended for this work.

A strain of *Mycobact. phlei* was used in most of the experiments because it could be readily distinguished from contaminants and on account of the ease with which it could be grown on common culture media. Details are given of the technique for the preparation of cultures for filtration, the actual filtration, culture media, and the technique of the inoculation of media.

" Growth was never obtained from any filtrate regardless of its age, the type of medium used or the number of serial subinoculations employed."

Twelve guinea pigs were inoculated with filtrate and acid-fast bacteria were found after prolonged searching in the lymph glands of three of them. The author advises that caution should be exercised in the interpretation of these results.

—T. M. DOYLE.

FELDMAN, W. H. (1934). **Subcutaneous Tuberculoid Lesions of Cattle. A Morphological Study.**—*Arch. Path. Lab. Med.* **17.** 533-545. 6 figs. [12 refs.]

Feldman made a histological study of the spontaneous tuberculoid, or so-called " skin lesions ", that occur in the subcutaneous tissue of cattle. These lesions appear to be widely distributed over the United States of America. Thirty-four specimens were obtained from cattle that had given positive tuberculin reactions but in which no lesions of tuberculosis were found at autopsy. Sixteen other specimens of skin lesions were received, but these were not considered to be typical of the condition under study. Few of the lesions actually involved the dermis. The specimens consisted of irregular, nodular masses, varying from 1 to 4 cm. in diameter, situated in the corium and underlying subcutaneous tissues. More than half of the specimens examined showed varying degrees of calcification. Sections of the lesions were stained with haematoxylin and eosin, and some with carbol fuchsin. Acid-fast bacilli were observed in 22 of the 34 specimens examined. The number of bacilli varied with the specimens – in some they were numerous, in others only one or two bacilli could be found after prolonged searching. In addition to the acid-fast organisms, non-acid-fast forms were also observed in the cellular debris.

Histologically, the specimens showed a monocytic and epithelioid reaction and bore a considerable resemblance to the lesions of tuberculosis. The central zone of the lesions showed a tendency to necrosis, but there was always a peripheral zone of monocytic and epithelioid cells. Giant cells of the Langhans type were present in some of the lesions.

The available evidence is against *Mycobact. tuberculosis* being the causal agent.—T. M. DOYLE.

DAINES, L. L., & AUSTIN, H. (1933). **A Study of So-Called Skin Lesions of Tuberculin-Reacting Cattle.**—*Amer. Rev. Tuberc.* **27.** 600-610. [19 refs.]

The authors give statistics for tuberculin tests in Utah for 1930, stating that of 622 reactors, 571 (91·8 per cent.) showed either skin or subcutaneous lesions only, or no visible lesions.

The literature of the investigation into the incidence of skin lesions of tuberculin-reacting cattle is summarized and the authors report their work on 225 such animals, 75 per cent. of which had given positive tuberculin reactions ; the remainder had not been tested. Three types of organism isolated from these cases are described and the results of inoculation trials with them on guinea pigs, rabbits, white mice, cows and chickens are given. The first type was an " acid-fast diphtheroid bacillus ", forming dry rough colonies on agar : it was the organism most frequently encountered, and usually caused nodules in test animals. The second was also an " acid-fast diphtheroid " which formed moist glistening colonies on agar ; the third type was not acid-fast and showed great pleomorphism.

Laboratory animals behaved very variably to test inoculations with these organisms, and some of the inoculations into cows produced skin lesions, some of which were typical. Intradermal tuberculin tests on the inoculated cattle usually yielded reactions which varied from negative to suspicious. In a consideration of the identity of the organism causing the skin lesions, the authors incline to the view that it is an undescribed new species.—J. E.

DAINES, L. L., & AUSTIN, H. (1934). **Acid-Fast and Non-Acid-Fast Micro-organisms in Skin Nodules of Tuberculin-Reacting Cattle.**—*Amer. Rev. Tuberc.* **30.** 209-213. [13 refs.]

The authors arbitrarily classify into the following four groups the organisms

isolated by them from the skin nodules of tuberculin-reacting cattle :– (1) an occasional *Mycobact. tuberculosis* (bovine strain) ; (2) a non-acid-fast and partially acid-fast, pleomorphic and usually chromogenic bacillus ; (3) an acid-fast, bacillary, pleomorphic, orange-coloured chromogen, and (4) a non-acid-fast, non-chromogenic, pleomorphic bacillus.

Several cows developed apparently typical skin lesions as the result of repeated subcutaneous inoculations of organisms of group 3. Two cows so inoculated gave definite but transitory tuberculin reactions and pronounced allergic reactions with a protein filtrate of group 3 organisms.

Daines and Austin believe that the results of their work strongly suggest that the group 3 organism is the cause of the skin nodules in cattle and that it gives rise to transitory tuberculin sensitiveness. There is also some evidence that this organism has a non-acid-fast, as well as an acid-fast, stage in its life cycle.

—T. M. Doyle.

Dunkin, G. W. (1934). **Johne's Disease. Its Economic Significance and Early Detection.**—*Vet. Rec.* **14.** 1551-1559.

Johne's disease may be noted in the early stages by a falling away of the muscles of the hind quarters. Motton states that an early symptom is the appearance of an oedematous swelling in the intermandibular space : it is intermittent and may be noted in the morning after a night at grass. Fading of the colour of the coat is also noted. Elimination of animals showing both symptoms has resulted in control of mortality. Cattle, sheep, deer, goats and buffaloes are susceptible. Bacteria are regularly found in lesions. Alexejiff-Goloff has isolated them from the foetus *in utero*, from the new-born calf and in the milk from three cows – thus explaining the appearance of the disease in three to six-month-old-calves. In sheep the disease is more acute than in cattle ; Stockman noted thickening of the intestinal mucous membrane, absence of corrugations, but numerous small haemorrhages under the mucous membrane. The author, in a similar outbreak, found that, although there were linear markings (resembling haemorrhages) and an accumulation of mucus, there was no thickening of the mucous membrane. Primary cultures are difficult to obtain from sheep, but subcultivation is easier than with bacteria obtained from cattle. Johnin prepared by the writer was used for the double intradermal test in 1926 and, although non-specific reactions were common, they could be discounted by experience. Synthetic johnin can now be prepared – even without the aid of other acid-fast bacteria – and is potent and incapable of producing non-specific reactions. A potency test is essential before issuing johnin, as with all biological products.—H. E. Bywater.

I. Bull, L. B., & Dickinson, C. G. (1934). **Caseous Lymphadenitis – Factors Associated with its Spread under Natural Conditions.**—*J. Coun. sci. industr. Res. Aust.* **7.** 78-86. [12 refs.]

II. Churchward, R. E. (1934). **Caseous Lymph-adenitis in a Goat.**—*Aust. vet. J.* **10.** 117-118.

I. Much of the work described here was published in a previous article [this *Bull.* **4.** 499.], which reported the demonstration of Preisz-Nocard bacilli in the soil of sheep " camping " grounds and in the faeces of sheep with infected lymph glands.

Under artificial conditions the Preisz-Nocard bacillus is adversely affected by acidity of the medium and the " camping " grounds were, therefore, treated with half a ton of sulphur per acre in order to make the reaction of the soil more acid. This brought about a lowering of the pH from 7·2 to between 4·2 and 5·2. The

Preisz-Nocard bacillus was demonstrated in the faeces of two out of 16 sheep which, on *post-mortem* examination, showed no lesions. Two lambs were drenched with 10 g. of pus from natural lesions of caseous lymphadenitis, and their faeces examined at various intervals. Out of 32 samples tested, the organism was demonstrated in the faeces of one lamb on the fifth day and of both on the 14th day after drenching. Apparently this organism can establish itself in the sheep's alimentary canal.

The experiments of DAYUS and HOPKIRK [this *Bull.* **4.** 95 and 414.], on controlling the disease by the elimination of all palpably infected animals, are discussed. The conclusion is drawn that their results do not support the hypothesis that infection is contracted chiefly in shearing sheds and yards. Preventive measures suggested include the provision of a clean paddock for the reception of all sheep after shearing. If this cannot be provided, the " camping " grounds should be treated with sulphur.

II. A case of caseous lymphadenitis in a goat is reported for the first time in Australia.—W. I. B. BEVERIDGE.

SCHMIDT, E. (1934). Fünfjahres-Ergebnisse (1927-1931) der Rotlaufimpfung in Mecklenburg-Schwerin. Die Auswirkung des staatlichen Entschädingungsverfahrens. [**Five Years' Experience in Immunization against Swine Erysipelas** (*Erysipelothrix rhusiopathiae* **Infection**) **in Mecklenburg-Schwerin**]. —*Berl. tierärztl. Wschr.* **50.** 353-357. 4 tables, 4 charts.

After April, 1927, all pigs in Mecklenburg-Schwerin were vaccinated against swine erysipelas, as well as against swine fever. Compensation, at full market value, was paid for animals that later became infected and were slaughtered. It was shown, from the five years' experience, that the disease is at its height during the summer from July to October. Pigs under three months old are not so susceptible to infection as pigs from five to eight months old. There is no evidence that different breeds show any varying resistance. After vaccination, which is best carried out in April or May, when the disease is at its lowest ebb, there was a considerable decrease in the disease and also in cases of chronic endocarditis. A certain number of control animals were not vaccinated, and the incidence of the disease in such animals appeared to be markedly higher than in the vaccinated pigs. —D. J. ANTHONY.

BABIN, A. (1934). Recherches expérimentales sur le rouget du cobaye. [**Experimental Swine Erysipelas in the Guinea Pig**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 64. [14 refs.]

Part I of this paper is mainly a discussion of natural immunity, but it also includes a description of the morphological, cultural and pathogenic characters of *Erysipelothrix rhusiopathiae* and a résumé of experimental infection of the guinea pig, commencing with DE VECCHI (1923).

Part II gives the author's own work, from which he concludes that the guinea pig is particularly susceptible to intradermal and intratesticular infection. By the latter it is possible to exalt the virulence of a strain so that by the sixth passage a septicaemia results regularly, which is fatal in 48 hours. In such cases, the most constant and significant lesions are cholecystitis and haemorrhagic swelling of the adrenal glands. Other changes include some swelling of the spleen, kidney and liver, serohaemorrhagic peritonitis and orchitis, often suppurative. Strains modified by such passage exhibit alterations in morphology, notably chains of short, slender bacilli or of coccoid forms, whilst their growth on artificial media is appreciably enhanced.—J. W. EMSLIE.

ALBRECHT, A. (1934). Neuere Beobachtungen über Schweinerotlauferkrankungen des Menschen und deren Infektionsquellen. [**New Observations on Swine Erysipelas in Man**].—*Dtsch. tierärztl. Wschr.* **42.** 71-75. [49 refs.]

The author gives a brief review of recorded cases of swine erysipelas infection in human beings during the last 20 years. The infection usually occurs in people handling infected pig carcasses, such as butchers, veterinary surgeons, and also laboratory workers. A few cases of intestinal infection are quoted, one fatal case in a ten-year-old girl, in which case organisms giving similar reactions to those of *Erysipelothrix rhusiopathiae* were isolated. Infection in human beings is generally localized in the hands and fingers, with occasionally some joint infection and swellings of the lymph glands. Cases are mentioned in which there was high fever, and even endocarditis, but these are rare. Serum against the swine erysipelas bacillus, prepared for human use, is beneficial, with local treatment of the skin where necessary.—D. J. ANTHONY.

MISSENARD. (1934). Au sujet de quelques Pasteurellas. [**On Some Pasteurellas**]. —*Rec. Méd. vét. exot.* **7.** 129-132. [1 ref.]

This is a description of various forms of pasteurella infection encountered by the author in different species of animals, together with a summary of the chief points and distinguishing features of the various strains of pasteurella organisms isolated.

In the course of the paper the author states that, although healthy cattle and sheep harbouring pasteurella organisms, culturally indistinguishable from the pathogenic strains, were submitted to various conditions in order to lower their resistance to infection, he failed to set up a typical form of pasteurellosis.

Reference is also made to pasteurellosis in a lion and an acute, sometimes subacute, form of infection communicable from rats to rabbits.

—GWILYM O. DAVIES.

I. JUNACK, M. (1933). Zur Diagnostik und Beurteilung der Gärtner-bazillose des Kalbes und der übrigen Fleischvergifterinfektionen des Rindes. Zur Technik und Indikation der bakteriologischen Fleischuntersuchung. [**Diagnosis of *Salmonella enteritidis* and Allied Infections of Calves and a Decision Concerning Action to be taken**].—*Dtsch. SchlachthofZtg.* **33.** 285-287.

II. HÖLZEL. (1934). Kühe als Bazillenausscheider und ihre fleischbeschauliche Beurteilung. [**Cows as Excretors of Paratyphoid Bacteria: their Examination at Meat Inspection**].—*Münch. tierärztl. Wschr.* **85.** 5-6. 1 table.

I. The author has records of the examination of 128 calf carcasses, divided as follows:—(1) 52 cases (40·6 per cent.) in which *S. enteritidis* (formerly *Bact. enteritidis* Gärtner) was found. From this series it is concluded that a bacteriological examination is necessary when the spleen, liver and kidneys are swollen, when there are areas of hepatization in the lungs or when there is evidence of jaundice. Evidence of lameness is seldom an indication. (2) 76 cases in which *S. enteritidis* was not found, but *Bact. coli*, *Proteus vulgaris* and various cocci were found.

Record is also made of the examination of three cows associated with food poisoning; from one only was *S. enteritidis* isolated, and only from the kidney. Various references to the literature are made.

II. Four cows, which had been associated with food poisoning and had been excreting bacteria of the salmonella group, were slaughtered and examined bacteriologically. *Post mortem*, one cow was shown to be suffering from a chronic traumatic

peritonitis and one from fluke infestation of the liver ; the other two appeared healthy. Examination of various specimens, including parts of the flesh, lymph glands, kidneys, spleen, liver, udder, bile, intestine and faeces, was carried out. *S. typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) was recovered from the kidneys, liver, bile and faeces of the cow which showed the chronic peritonitis. It would have been difficult to isolate the bacteria from the liver and kidneys had not recourse to a special medium been made [KAUFFMANN. (1931). *Zlb. Bakt. I.* (*Orig.*). **119.** 152].

Bacteria of the salmonella group were not isolated from the other three cows.

Latent infections of such a nature are dangerous to other susceptible animals and also to man.—R. LOVELL.

WATANABE, S. (1934). **On the Salmonella Infection Among Foxes and a Dog.**—*J. Jap. Soc. vet. Sci.* **13.** 77-91. 8 tables. [22 refs.] [Orig. in Japanese : abst. from English summary].

Six fatal cases of salmonellosis are recorded, five in foxes and one in a dog. All the animals suffered from loss of appetite and diarrhoea and on *post-mortem* examination showed icterus, enteritis and splenomegaly. The causal organisms in each case appeared identical and from their biological and serological behaviour were most probably *S. typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau).—NORMAN HOLE.

WATANABE, S. (1934). **On Types of *Bact. suipestifer* Isolated from Swine in Manchukuo.**—*J. Jap. Soc. vet. Sci.* **13.** 192-206. 9 tables. [17 refs.] [Orig. in Japanese : abst. from English summary].

Sixty-six strains of *Salmonella cholerae-suis* (formerly *Bact. suipestifer*) have been isolated from swine in Manchukuo, and grouped according to the classification of WHITE and KAUFFMANN. Forty-one of the strains were recovered from swine inoculated with swine fever virus, 12 from natural cases of swine fever, 10 from cases of swine paratyphoid, 2 from healthy pigs, and one from an animal dead of emaciation. Thirty-five of the strains proved to be *S. cholerae-suis* var. *kunzendorf* (formerly *Bact. suipestifer*, European variety, monophasic), 27 *S. cholerae-suis* (Smith) *comb. nov.* (formerly *Bact. suipestifer*, American variety, diphasic) and 4 *S. typhi-suis* var. *voldagsen*. The two former were found in cases of natural and experimental swine fever and in swine paratyphoid, while all four Voldagsen types were recovered from swine paratyphoid cases. An examination of 93 pigs slaughtered at the abattoir at Mukden showed 2·1 per cent. to be infected with *S. cholerae-suis* (Smith).—NORMAN HOLE.

WRIGHT, R. D. (1933). **A Salmonella Infection (Bacillus typhi murium) in a Stock of Experimental Mice, with Observations on the Morbid Anatomy and Epidemiology.**—*Med. J. Aust.* Dec. 30th. 875-878. 2 figs., 1 graph. [10 refs.]

An epidemic of mouse typhoid due to *Salmonella typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) is recorded. It is shown that there is often a falling body temperature in such mice when moribund and that an acute infective ulceration of the gastric and duodenal region is common. Should the mouse survive, a chronic " peptic " ulcer, similar to the human type, may be present. Epidemiologically it appeared as if a falling atmospheric temperature increased the susceptibility to fatal infection. Further, as has been shown experimentally, the addition of new susceptibles – in this case by breeding – is a potent factor in increasing the mortality rate in an epidemic. Steps taken to control the

epidemic included the raising of cages on trays and allowing faeces to fall through wire mesh so that food could not be contaminated. The room temperature was also regulated at 67° to 70° C. and the death rate fell within a fortnight.

—R. Lovell.

David, H., & Eidherr, A. (1934). Ueber Breslauerkrankungen bei Papageien und anderen Ziervögeln. [*Salmonella typhi-murium* (**formerly** *Bact. aertrycke* **or** *Bact. enteritidis* **Breslau**) **Infection of Parrots and Other Caged Birds**].—*Tierärztl. Rdsch.* **40.** 523-526. [21 refs.]

The material studied in this communication consisted of about 200 different types of birds, kept in a zoological garden. Various diseases were encountered and, although non-specific forms of enteritis occurred, in about 10 per cent. of such cases in which complete bacteriological examination was made, *S. typhi-murium* appeared to be the cause. The symptoms included lassitude, inappetence and blood-stained diarrhoea ; death ensued three to eight days after the onset of symptoms. *Post-mortem* examination showed pale-coloured liver with yellowish-grey pin-head foci, swollen spleen with smaller foci and haemorrhagic intestines with blood-stained, slimy contents. The causal bacterium was isolated from the various organs and identified by morphological, biochemical and serological methods. Various epidemiological features are mentioned and, as a prophylactic measure, 1 : 1,000 " chinosol " was added to the drinking water.

The danger of human infection due to contact with such birds is mentioned.

—R. Lovell.

Herrmann, W. (1934). Ein gasloser Breslaustamm aus Fäzes und ein Pullorumstamm aus Kartoffelsalat. Zugleich ein Beitrag zur Frage des Gärprozesses bei pathogenen Darmbakterien und ihrer Differenzierung. [**A Non-Gas-Producing Strain of** *Salmonella typhi-murium* **from Faeces and an** *S. pullorum* **Strain from Potato Salad. The Fermentation of Pathogenic Intestinal Bacteria and their Differentiation**].—*Zlb. Bakt. I.* (*Orig.*). **132.** 148-160. 3 tables. [25 refs.]

A strain of *S. typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) isolated from the faeces of an acute case of gastro-enteritis failed to produce gas in the usual carbohydrate media.

A further report concerns an attack of gastro-enteritis in two persons who had eaten potato salad made with hens' eggs. An organism isolated from the food and from the faeces of both patients appeared to be *S.* (formerly *Bact.*) *pullorum.*

The biochemical reactions of various members of the salmonella group are discussed particularly in the light of the type of substrate and indicators used, and the author favours such methods as giving more information than serological methods. [In spite of the variety of sugars and substrate used, serological methods are considered to be more useful than biochemical methods although the latter are exceedingly useful if used in conjunction or as a preliminary test].—R. Lovell.

Kauffmann, F., & Silberstein, W. (1934). Untersuchungen über eininge neue Salmonella-Typen. [**New Types of Salmonella**].—*Zlb. Bakt. I.* (*Orig.*). **132.** 431-437. 1 table. [11 refs.]

Certain of the salmonella have been re-examined, particularly regarding their antigenic structure, in the light of the agreement reached by the Salmonella sub-committee of the Nomenclature Committee of the International Society for Microbiology [see this *Bull.* **5.** 63]. They include *S. heidelberg, bareilly, eastbourne, anatum, abortus-ovis* and *london.* Hitherto strains of *S. anatum* have been

isolated from ducks only, but there are now records of their having been isolated from cases of human disease. It is pointed out that three members of the salmonella group are now concerned with ducks and their eggs and human disease, viz., *S. typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau), *S. enteritidis* (formerly *Bact. enteritidis* Gärtner) and *S. anatum*.

One strain of *S. anatum* examined varied slightly in its group or non-specific antigens, viz., *S. anatum* var. *muenster*.—R. Lovell.

Smith, J. (1934). **Sporadic Salmonella Infections : A New Salmonella Type.**—*J. Hyg., Camb.* **34.** 351-360. 1 table. [17 refs.]

During 1929 to 1932 there occurred in north-east Scotland 30 outbreaks of salmonella infection involving 46 cases whereas, in 1933, 30 outbreaks involving 44 cases were encountered. The most frequent causes of such outbreaks are *S. typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau), *S. thompson*, *S. enteritidis* (formerly *Bact. enteritidis* Gärtner) var. *dublin* and *S. cholerae-suis* var. *kunzendorf* (formerly *Bact. suipestifer*, European variety, monophasic).

The *dublin* and *cholerae-suis* (*suipestifer*) types appear to be more tissue-invasive than the other types, septicaemia and meningitis having been associated with the former and septicaemia with the latter, whereas the other common types produce for the most part symptoms of acute enteritis.

A case of infection with *S. potsdam* is recorded, this being the first in this country, and a new salmonella type, *S. aberdeen*, is described. The latter was isolated from a case of acute enteritis and, although its H antigens are similar to those of *S. typhi-murium*, the O antigen is not shared by any other recorded type and, under the Kauffmann-White scheme, receives the symbol XI.—R. Lovell.

I. Warrack, G. H., & Dalling, T. (1933). **Salmonella Infections in Young Ducklings and Ducks' Eggs.**—*Vet. J.* **89.** 483-487. [5 refs.]

II. Schaaf, J. (1934). Untersuchungen über den Ansteckungskreislauf bei der infektiösen Enteritis der Enten. [**Pathogenesis of Infectious Enteritis of Ducks**].—*Arch. wiss. prakt. Tierheilk.* **67.** 224-238. 4 figs., 1 table. [3 refs.]

I. Ducklings may be infected with either *S. typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) or *S. enteritidis* (formerly *Bact. enteritidis* Gärtner) ; with the former the source of infection may be either the egg or from the outside, but infection with *S. enteritidis* appears to come chiefly from the egg. A large number of adult ducks have been blood-tested against both these organisms and the reactors picked out and kept under observation. *S. typhi-murium* has been recovered from the eggs of such birds in eight instances and *S. enteritidis* in 17 instances. The organisms have frequently been isolated from the ovaries of such carrier ducks after death. The production of infected eggs appears to decrease as the titre of the blood falls away.

II. The infection of ducks with *S. enteritidis* was brought about by treating their food with cultures of the organism and the effect of such infection was studied. Blood tests carried out from the tenth day showed a fluctuating titre up to 1 : 400 and, of 217 eggs examined, eight were found to be infected in the yolk and 45 on the outer shell. At *post-mortem* examination the ovaries of most of the ducks resembled those of birds affected with *S.* (formerly *Bact.*) *pullorum*, but one duck, having an apparently normal ovary, had laid a yolk-infected egg. The result of hatching eggs laid by infected ducks shows that infection chiefly leads to the death of the embryo in the shell, and that only a few infected ducklings hatch. Shell infection may be equally responsible for the loss of a hatch. The feeding of infected food to ducklings leads to a considerable mortality and also to latent infection.

The disease, therefore, follows a cycle like that of *S. pullorum* infection, and the droppings of adult carriers play an important part in dissemination.

—Norman Hole.

Schaaf, J. (1933). Zur infektiösen Enteritis der Enten. [**Infectious Enteritis in Ducks**].—*Zlb. Bakt. I.* (*Orig.*). **128.** 519-530. 6 figs. [40 refs.]

An outbreak of enteritis in ducklings is described. The symptoms were typical of severe enteritis in birds. Pathologically, the lesions were those of an acute catarrhal, haemorrhagic or diphtheritic enteritis, followed by a spread of infection *via* the blood stream, with the formation of multiple foci of necrosis in the internal organs. The causal organism was diagnosed as *Salmonella typhimurium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau), on account of its biochemical, serological and bacteriophage reactions.—E. J. Pullinger.

Litzke, H. (1934). Untersuchungen über Zusammenhänge der Eileiterentzündung der Hühner mit der Pullorum-Infektion. [**Connection between** *Salmonella* (**formerly** *Bact.*) *pullorum* **Infection and Inflammation of the Oviduct in Fowls**].—*Inaug. Diss. Berlin.* pp. 25. 2 tables. [64 refs.]

Inflammation of the oviduct is frequently associated with degeneration of the ovarian follicles. By means of cultural and serological tests, 20 per cent. of 39 fowls suffering from inflammation of the oviduct were found to be infected with *S. pullorum*.—E. J. Pullinger.

Torrey, J. P., & Graham, R. (1934). **Partial or Doubtful Reactors to the Whole Blood Stained Antigen Test for Pullorum Disease.**—*Cornell Vet.* **24.** 156-162. 2 tables. [4 refs.]

Experiments were carried out to obtain information on the incidence of *Salmonella* (formerly *Bact.*) *pullorum* infection in doubtful or partial reactors.

A group of 25 partial or doubtful reacting fowls was purchased from flocks and subjected to repeated tests by different agglutination methods over a period of three and a half months. The three tests were made at intervals varying from one week to one month by the plate method with whole-blood stained antigen, the plate method with clear serum and by the tube method.

Twelve of the 25 became consistent reactors to one or other of the three tests, four to the whole-blood stained antigen test, three to the plate method and four to the tube agglutination method. The tube and whole-blood stained antigen tests gave repeatedly similar results in only one fowl. Twenty-one fowls gave inconsistent agglutination reactions to the plate method with whole-blood stained antigen, 22 to the plate method with clear serum and 19 to the tube test.

Post-mortem examination of the 25 birds revealed no gross ovarian lesions of *S. pullorum* infection. *S. pullorum* was only found in direct cultures of ovarian and liver tissue from one bird.—Norman Dobson.

I. Biely, J., & Lloyd, E. A. (1934). **Agglutination Tests for the Detection of Pullorum Disease of Fowls.**—*Vet. Rec.* **14.** 878-882. [14 refs.]

II. Higgins, W. A., & Schroeder, C. H. (1934). **The Diagnostic Value of the Various Tests for Pullorum Disease.**—*Poult. Sci.* **13.** 239-241. 1 table. [2 refs.]

I. The authors discuss several comparative tests carried out for the detection of carriers of *Salmonella* (formerly *Bact.*) *pullorum* by means of the tube agglutination method and the rapid whole-blood test. The conclusion is drawn that, provided the antigen is properly prepared and titrated, and the test carried out

only by accredited veterinarians, the rapid whole-blood test may well be worth consideration in any scheme for the eradication of this disease. Experience and training have been found to be essential and, although the test appears to be simple, it is evident that it cannot be applied indiscriminately by laymen.

II. Experiments were planned to test the value of stained antigen in comparison with the tube method for the detection of carriers of *S. pullorum*. Five stained antigens were employed, two obtained from state departments and three from commercial sources. The commercial stained antigens are manufactured under federal licence. The test was carried out twice, with a four months' interval, using 108 birds. Incomplete agreement was obtained between the results with the tube agglutination test as compared with the rapid whole-blood test with four of the five stained antigens.

One brew of stained antigen, prepared commercially, produced very marked discrepancies. In one group of 93 birds, all were found by means of the tube method to be negative. Using the commercial antigen at the first test, 26 of these were found to be positive. At the second test by the tube method, 80 were found to be negative and 13 positive, and with the stained antigen 52 negative and 41 positive.

[Sufficient evidence has obviously been submitted to show that a commercial antigen, even when manufactured under federal licence, does not always supply the poultry farmer with accurate information regarding the amount of infection in his flock, even when the test is carried out by experienced laboratory workers].

—Norman Dobson.

Biely, J., Lloyd, E. A., & Roach, W. (1933). **Pullorum Disease.** pp. 30. 7 tables. Victoria, B.C.: British Columbia Dept. Agric. [4to] [Mimeographed].

This is a comprehensive survey of *Salmonella* (formerly *Bact.*) *pullorum* infection as it affects the management of poultry, the various practical aspects being clearly presented under the following heads :– cause, cycle of infection, introduction and spread of the disease, symptoms, course of the disease, control of the disease in chickens, disinfection of incubators, the agglutination test, accuracy of the agglutination test, prevalence of *S. pullorum* infection, the economic aspect and eradication. Great stress is laid on the benefits derived from the use of the agglutination test and numerous experiments are described showing the accuracy of the various methods of applying the test. In the experiments quoted, *S. pullorum* could be recovered on the average from 92 to 94 per cent. of the positive reactors to the agglutination test, while, in 45 positive reactors and 45 negative reactors, independently tested four times at monthly intervals by three laboratories, there was disagreement in only 0·77 per cent. of cases. The rapid whole-blood test, when carried out by trained technicians, gave 98·3 per cent. agreement with the slow tube test ; but when diagnosis was made by an untrained man there was a variance of 12 per cent. The intradermal pullorin test is not recommended, being only 70 to 75 per cent. efficient.

The economic aspect of the disease is fully described, showing the effects of *S. pullorum* infection on fertility, hatchability, and viability of chicks, growth and development, egg production and mortality rate in adults.

In Massachusetts, where an eradication policy has been adopted, the percentage of reactors has been reduced from 12·5 to 0·9 in 12 years. In 1932, 355 out of 455 flocks tested, as compared with 25 out of 108 flocks in 1921, were free from the disease. The regulations for eradication of the disease, formulated by the Massachusetts Agricultural Experiment Station, are described.

—R. F. Gordon.

Bunyea, H. (1934). **Comparison of the Pullorin and the Rapid Whole-Blood Agglutination Tests for Pullorum Disease.**—*J. agric. Res.* **48.** 837-843. 4 tables. [6 refs.]

Four flocks were tested for *Salmonella* (formerly *Bact.*) *pullorum* infection by the stained antigen rapid whole-blood agglutination test and by the pullorin test. In three of the flocks the slow tube agglutination test was used as a check on the rapid whole-blood test. *Post-mortem* and bacteriological examinations were carried out on specimen birds from the four flocks and the results compared with the test findings.

In every group the agreement between the rapid whole-blood test and the bacteriological findings was more favourable than that between the pullorin test and the bacteriological findings. The results with the slow tube test supported the reliability of the rapid whole-blood test.

A summary of the results from the four flocks is as follows :– the average agreement between the rapid whole-blood test and the slow tube test was 94·4 per cent., and between the rapid test and the bacteriological findings, 81·2 per cent. ; the average agreement between the pullorin test and the slow tube test was 19·4 per cent., and between the pullorin test and the bacteriological findings, 26 per cent.

From these results the pullorin test does not appear to be a satisfactory method for the diagnosis of *S. pullorum* infection.—R. F. Gordon.

Bahr, L., & Christensen, N. P. C. (1933). Nogle Undersøgelser vedrørende B. pullorum og Bakterier henhørende til Salmonella-Gruppen. **[Investigations on *Salmonella* (formerly *Bact.*) *pullorum* and Bacteria belonging to the Salmonella Group].**—*Maanedsskr. Dyrlaeg.* **45.** 417-434. 10 tables. [9 refs.]

The authors consider that the agglutinin of the serum reaction is not absolutely specific. *S. paratyphi* (formerly *Bact. paratyphosum*) B, *S. typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau), *S.* (formerly *Bact.*) *abortus equi* and *S. enteritidis* (formerly *Bact. enteritidis* Gärtner) are said to be agglutinated more or less markedly by numerous *pullorum* sera. As these organisms rarely cause disease in fowls and as " ratin " bacteria, according to the authors' observations, cannot cause infection or agglutinin formation in chickens and hens by administration *per os*, the conclusion is drawn that in spite of these limitations the practical value of the agglutination test for the diagnosis of *S. pullorum* infection is unchallenged.

The authors consider an agglutination in the dilution 1 : 50 positive.

—H. C. Bendixen (Copenhagen).

I. Bourguignon, G. C. (1933). La typhose aviaire à Stanleyville. **[Fowl Typhoid at Stanleyville (Belgian Congo)].**—*Bull. agric. Congo belge.* **24.** 236-264. 8 tables. [38 refs.]

II. Gauger, H. C. (1934). **A Chronic Carrier of Fowl Typhoid with Testicular Focalization.**—*J. Amer. vet. med. Ass.* **84.** 248-251. [3 refs.]

I. An account of the symptomatology of the disease, the recovery of the organism and its morphological, cultural and biochemical characters. An interesting observation was the recovery of the organism from the faeces of a fowl that gave a negative reaction to the agglutination test. A bacteriophage against the organism was recovered from the droppings of an infected fowl. Serologically, there appeared to be a degree of cross-agglutination with paratyphoid A. [This is not recognized as a character of *Salmonella gallinarum* (formerly *Bact. sanguinarium*)]. The rabbit and guinea pig seemed very resistant to subcutaneous inoculation.

II. *S. gallinarum* was found focalized in the testicles of a two-year-old cock bird suffering from nervous symptoms.—Norman Hole.

KAUFFMANN, F. (1934). Untersuchungen über die Duisburger Gallinarum-Stämme. [**Investigations of the Duisburg Strains of** *Salmonella* (**formerly** *Bact.*) *gallinarum*].—*Zlb. Bakt. I.* (*Orig.*). **132.** 337-342. 3 tables. [8 refs.]

The author emphasizes that the following definition must be born in mind when deciding whether an unknown organism belongs to the genus *Salmonella*. *Salmonella* bacilli are Gram-negative, lack spores and capsules and are usually motile ; they develop on ordinary media, always ferment dextrose, with or without gas formation, lactose, saccharose and adonite, are unaltered after 30 days' incubation at 37°C., gelatine is not liquefied, indol is not produced and the antigens must fit into the salmonella group.

Three strains of *S. gallinarum* isolated from cases of acute gastro-enteritis at Duisburg were compared with five stock strains of *S. gallinarum*, four of *S.* (formerly *Bact.*) *pullorum* and one of *S. typhi* (formerly *Bact. typhosum*). Colony formation on agar, action in litmus milk, maltose, dulcite, rhamnose, d-tartrate and dextrin, and the formation of gas and indol proved to be factors upon which these four classes of organisms could be differentiated. The Duisburg strains appeared to be variants of the normal *S. gallinarum*. The somatic antigens of the Duisburg and stock strains of *S. gallinarum* corresponded to those of *S. pullorum* and *S. typhi*.

—E. J. PULLINGER.

WALL, S. (1934). Inkubationstidens längd vid sjukdomen : Smittsam kastning hos nötkreatur. (Tiden mellan infektionen och kastningen). [**Incubation Period in Bovine Contagious Abortion**].—*Skand. VetTidskr.* **24.** 453-489. 3 tables. [9 refs.] [English summary : abst. from orig.]

The author first refers at length to the observations of PRÖSCHOLDT [this *Bull.* **3.** 175.] on the interval in natural circumstances between infection in cattle and the occurrence of abortion. The findings were calculated from circumstantial evidence depending upon the dates on which infected animals had been introduced into uninfected herds, thereby causing cows of the original herd to abort.

Wall made similar observations and also employed the " experimental method ". For the former he observed the course of a recurrence of infection in a large herd which, during the past five years, had finally freed itself from infection. He took, as the " incubation period ", the period between an abortion and the abortion next preceding it [not a very reliable procedure, as the author admits]. A second large herd, free from infection when first investigated in 1930, was also under observation.

Data for the experimental part of the work was collected from a number of separate experiments on various aspects of brucellosis, carried out by the staff of the State Veterinary Bacteriological Institute, Stockholm, in recent years (results of artificial infection of control animals).

It was found that the " calculated results " in natural infection approximated the " experimental results ", showing that the former are more or less reliable and that the method of calculation used is suitable for use in practice.

The " incubation period " in bovine contagious abortion varies very widely and may be as short as about two weeks or as long as six months. In about 40 per cent. of all cases, the " incubation period " was between 30 and 60 days, in 43 per cent. it was over 60 days and in 17 per cent. it was under 30 days. " Incubation periods " of 90 to 180 days totalled 34 per cent. of all cases, 18 per cent. being of 90 to 120 days.—J. E.

HOLTH, H. (1934). Bekjempelse av den smittsomme kastning ved hygieniske foranstaltninger og ved vaksinasjon. [**Control of Contagious Abortion by**

Vaccination and Hygienic Measures].—*4. Nord. Vet.-mötet. Helsingfors. 1933.* pp. 434-449. 2 tables. [English summary : abst. from orig.]

A statistical account is given of the incidence of contagious abortion in Norway and of the public regulations in force. Control became more possible after the decision, in 1912, to make agglutination and complement-fixation tests for diagnosis obligatory. As regards control, particular stress has been laid on the prevention of the spread of infection.

Eradication of the disease within the individual herd has usually been postponed until the chronic stage, with little tendency to infect other animals, has been reached. It has then been customary to remove the infected animals shortly before sending the herd out to pasture for the summer ; the byres have then been thoroughly cleaned and disinfected, and have been dried out and aired while standing empty during the summer. In the autumn the herds have been tested serologically. Vaccination has little application.—L. Slagsvold (Oslo).

Birch, R. R., Milks, C. H., & Gilman, H. L. (1934). **The Handling of Bang's Disease in the Field. With Records of Reproduction of Clean Cattle, Recent Reactors and Chronic Reactors Covering 5,074 Cow-Years.**—*J. Amer. vet. med. Ass.* **84.** 341-362. 10 tables, 1 chart. [3 refs.]

This report summarizes data accumulated by officers of the New York State Veterinary College since 1928. Methods of control based on the agglutination test were used, and agglutination in a titre of 1 : 100 or above was taken as positive. Fluctuation in the titre in consecutive tests of the same animal was noted.

One, or a combination, of the following three plans for the disposal of reactors was adopted :- (1) sale of reactors, when the number was small and associated non-reactors were of high value ; (2) complete segregation : two separate units maintained : the calves from the reactor unit were raised with them and added to the clean unit not less than one month after they had taken their last milk, and (3) partial segregation. This method was adopted when there was a considerable number of reactors and only single premises available. Reacting and clean cows were separated in the same barn ; the two groups were never allowed at liberty together, and calves were handled as in (2). Complete segregation or sale of reactors is recommended, but partial segregation can be effective. A few animals completely overcome the infection.—C. R. Turbet.

Stewart, W. L. (1934). **The Control of Contagious Abortion.**—*Vet. Rec.* **14.** 1399-1413. 1 table. [18 refs.]

After a brief review, Stewart discusses the rationale of vaccination, citing the results of certain other workers and his own to show that the use of living vaccine does not necessarily lead to permanent infection, and that its use in a herd may be accompanied by no permanent increase of reactors. He favours actual eradication of the disease when possible, and gives some useful figures to show the loss in milk consequent to abortion at various stages of pregnancy.

A discussion followed, in which the various methods of vaccination, and the relative advantages and disadvantages of vaccination and eradication were considered.—A. W. Stableforth.

Oppermann. (1934). Neue Wege für die Bekämpfung des Bang'schen Abortus des Rindes. [**New Ways of Combating Bovine Contagious Abortion**].—*Dtsch. tierärztl. Wschr.* **42.** 455.

Wagener. (1934). Das Abortusproblem vom Standpunkt der Umweltforschung. [**The Abortion Problem in a Wide Sense**].—*Ibid.* 455-456.

These are short addresses, delivered to the members of the seventh meeting of Specialists in Diseases of Breeding Animals, Bonn, in May, 1934.

Oppermann refers to the check in progress in the attempts to control contagious abortion by the use of specific vaccines, and advocates the wider use of non-specific protein therapy, referring to a new proprietary preparation called " serobortan ", which is said to have given promising results.

Wagener spoke in a similar strain, emphasizing the importance of general hygiene and dietetics for the raising of healthy animals, by which means alone secondary diseases of bacterial nature can be avoided.—J. E.

Kritschewski, I. L., & Halperin, E. P. (1934). Untersuchungen über das Wesen der erwobenen Immunität. I. Mitteilung. Ueber den Mechanismus der abortiven Wirkung des B. abortus. [**Experiments on the Mechanism of Active Immunity. I. On the Abortive Action of** *Br. abortus*].—*Z. ImmunForsch.* **82.** 421-428. 1 fig. [4 refs.]

Not being satisfied with the view that the abortive action of *Br. abortus* is due exclusively to anatomical lesions in the uterus and the placenta, the authors first set out to find whether abortion was due to a process similar to Shwartzman's phenomenon. Finding no evidence that this phenomenon was concerned they next proceeded to investigate the possibility that *Br. abortus* produced an endotoxin which caused abortion by producing contraction of the uterine musculature. A so-called endotoxin was prepared by heating a thick saline suspension of *Br. abortus* for two to two and a half hours at 60°C. Its action was tested on the uterine muscle of virgin guinea pigs by the Dale technique, 14 experiments being made. The *Br. abortus* endotoxin regularly produced marked contraction of the uterine muscle, which was as strong or stronger than that produced by a similar amount of 1 : 50,000 histamine. *Br. melitensis* produced a similar result in the one test reported. Control experiments with the condensation water of the culture medium and with *Staphylococcus aureus*, the typhoid bacillus and Friedländer's bacillus showed that these had little or no action on uterine muscle.

Further experiments shortly to be published by Kritschewski and Galanowa have shown that the uterus of immunized guinea pigs is not affected by *Br. abortus* endotoxin, a fact which explains why killed or living vaccines protect against actual abortion although they are unable to rid the body of the causal organisms [see also (1934). *Arch. wiss. prakt. Tierheilk.* **68.** 277].—A. W. Stableforth.

Tullberg, K. A. (1933). Försök på marsvin med abortvaccin. [*Br. abortus* **Vaccine Trials on Guinea Pigs**].—*Skand. VetTidskr.* **23.** 433-445. 2 tables. [English summary : abst. from orig.]

Eight weeks after vaccination with a heat-killed *Br. abortus* bacterin, when the blood showed no further agglutination reaction, 100 guinea pigs were again infected with living *Br. abortus*, together with 100 non-vaccinated control animals. The blood of both series was tested at intervals of a week.

Both bacterin and infective material were injected directly into the heart, and blood was drawn from the heart for test.

After vaccination and before infection, the agglutination reaction was found to be at its height in one to two weeks and had disappeared after five or six weeks. After infection with the living organism, the reaction was found to be lower in the case of the vaccinated animals for the first six weeks, but both series reached approximately the same level during the 7th, 8th and 9th weeks. In the vaccinated animals there was a steady decline until, after eight months, agglutinins had

entirely disappeared from the blood. In the non-vaccinated animals the agglutination value was still comparatively high after eight months.

The tables and conclusions show that the resistance of the vaccinated guinea pigs was greater and the course of the disease milder than in the case of non-vaccinated animals.—A. A. Forsyth.

Hieronymi, E., & Gilde, H. (1934). Die Brucella-Bang-Infektion beim Pferde als Ursache von Widerrist- und Genickfisteln. [*Brucella abortus* **Infection in Horses as the Cause of Fistulous Withers and Poll-Evil**].—*Z. InfektKr. Haustiere.* **47.** 24-47. [35 refs.]

The authors here present evidence in support of the view that fistulous withers and poll-evil may be due to infection with *Br. abortus*. They especially investigated the influence of collar pressure and injury of a similar nature, and were satisfied that this played no part in the causation.

Of 53 horses examined, consisting of all types, 86·78 per cent. gave a positive agglutination reaction at a titre of 1 : 100 or more against *Br. abortus*. Most reacted up to a dilution of 1 : 1,000, and the highest titre recorded was 1 : 40,000. The blood of 105 normal control horses gave negative results. In 14 instances, *Br. abortus* was isolated in pure culture.

The clinical appearance and characters of the lesions are described. In uncomplicated cases the discharge is sero-fibrinous, but when secondary invaders are present the picture is altered.

The authors believe that infection takes place by way of the alimentary tract, and refer to the close association between the cases recorded and cattle affected with contagious abortion.—N. S. Barron.

Saunié, L. M. (1934). Les réactions allergiques dans le diagnostic des Brucelloses. [**Diagnosis of Brucellosis by Allergic Tests**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 79. 6 tables. [62 refs.]

The author refers briefly to the recent history of brucellosis and its economic importance for stock-breeders. He surveys the existing knowledge of the diagnostic value of intradermal allergic tests for brucellosis, and gives the results of some comparative serological tests carried out on bovines and equines.

He concludes that the intradermal reaction, which occurs in infected animals, is specific, that the application of the test is simple, and that it can be readily carried out under field conditions.

Serological tests are essentially laboratory methods and are, in the author's opinion [and contrary to the views generally held], less sensitive than the intradermal test.—T. M. Doyle.

Ber, A. (1933). Verlauf der Banginfektion bei der weissen Maus. [**Course of *Br. abortus* Infection in White Mice**].—*Z. InfektKr. Haustiere.* **44.** 129-145. 5 tables. [14 refs.]

With large subcutaneous doses of *Br. abortus* (the order of magnitude being 800×10^6 organisms), white mice show loss of body weight, swelling of the spleen and lymph glands and a septicaemia which appears within 24 hours and may last for six months or more. In the case of small doses, organisms are collected in the spleen and lymph glands, from which they may be isolated by culture. In the mouse, antibody reaction to this infection is slow and the agglutination reaction is consequently unreliable for diagnosis. Intraperitoneal inoculation results in a slightly more rapid onset of infection.

The author considers that the white mouse constitutes a useful experimental

animal for diagnostic purposes. Two to four mice should be used for a test, and these may be killed and examined by culture 15 to 30 days after inoculation.

—E. J. Pullinger.

Gilbert, Ruth, & Coleman, Marion B. (1934). **Undulant Fever in New York State.**—*J. infect. Dis.* **54.** 305-312. 2 tables. [10 refs.]

The authors, in studying the incidence of undulant fever in New York State, set out to prove which strain of *Br. abortus* is the most prevalent and is the chief cause of human infection. They tested milk – from 383 cows in 68 herds – which had been used by patients in whom undulant fever had developed. They were also enabled to test blood from 1,290 cows. They computed that 18 per cent. of the cattle in New York State would react to the agglutination test, and in 1930 it seemed that 28 per cent. of the milk consumed by 3,000,000 people in New York was raw and unpasteurized.

In 1930, 165 cases of undulant fever were reported in New York State, in 1931, 171 and in 1932, 227. Even so, the authors doubt if even one-tenth of the cases which really occur have ever been diagnosed. They then discuss the symptoms of the disease in human beings and the properties of the various strains of the *abortus-melitensis* group.

In conclusion they consider that, if the micro-organisms of the *abortus-melitensis* group can be divided into sub-species, only one, namely the bovine, is at all prevalent in the area concerned. They also agree with other workers that cattle or dairy products are the sources of infection of the undulant fever cases studied.—D. S. Rabagliati.

Gilbert, S. J. (1934). **Pulpy Kidney Disease (Entero-Toxaemia) of Sheep in Palestine.**—*J. comp. Path.* **47.** 255-258. 1 table. [2 refs.]

Two outbreaks of entero-toxaemia were met with ; in one, 49 animals out of 805 died. The small intestine was reported to be inflamed in about 50 per cent. of cases. Filtrate of intestinal contents of one case from each outbreak showed the presence of toxin which, by serum neutralization tests, was found to be *Clostridium welchii* toxin type D.

Cl. welchii, described as of type D, was also obtained from cultures made from the spleen of a dead sheep, and from the intestines of another sheep. These cultures were not toxic except when the acid produced in growth was neutralized. The author suggests that the reason for the healthier lambs being affected in this disease is that, in these, any unnatural acidity would be corrected and thus toxin production would not be interfered with.—A. Brownlee.

Orr, J. H., & Reed, G. B. (1934). **Influence of Cysteine on the Production of Haemotoxin of** *Cl. welchii*.—*Canad. J. Res.* **11.** 622-627. 1 fig., 6 tables. [9 refs.]

Unexplained wide variation was met with in the yield of haemotoxin produced in similar batches of media sown with a stabilized culture. Robertson's bullock's heart medium – 0·1 per cent. glucose was the standard medium used. To different flasks of this medium were added the following amino acids to a concentration of 0·1 per cent. :– alanin, cysteine, cystine, tyrosin, histidine, tryptophane and glycine, together with creatin and creatinine to the same concentration. The flasks were boiled, cooled and inoculated with the S type of a toxin-producing strain of *Clostridium welchii*, sealed and incubated for 21 to 22 hours. Filtrates were prepared and titrated against washed rabbit red blood corpuscles. It was found that cystine and cysteine (the latter slightly more than the former) have a profound

inhibiting effect on haemotoxin production. The other amino acids tested had no effect on toxin production. The fact that alanin has the same structure as cysteine, except for the absence of the SH group, suggested that the S or the SH group was the inhibiting factor.

A saturated solution of H_2S added to the medium to a concentration of 2 per cent. (the medium was buffered so that this addition did not affect the pH) also inhibited haemotoxin production. This concentration of H_2S added to already-formed toxin and allowed to interact for several days had little effect on the toxin, indicating that it is the metabolism of the organism which the H_2S alters.

The presence of cysteine in the media does not alter the change in the pH on growth, but it does cause a reduction in the fall in the oxidation reduction potential, and the authors consider that this change is responsible for the inhibition of haemotoxin production.

Fish muscle contains twice as much cystine as beef muscle, and this factor is probably responsible for the haemotoxin production being lower in cultures in media prepared from fish muscle than in cultures in similar media prepared from beef muscle.—A. Brownlee.

Mason, J. H. (1934). **The Liquefaction of Inspissated Serum by the "Lamb Dysentery Bacillus".**—*Onderstepoort J. vet. Sci.* **2.** 33-37. 2 tables, 2 charts. [5 refs.]

The writer was able to confirm the original statement of Dalling that the lamb dysentery bacillus rapidly liquefied inspissated horse serum. Single cell cultures of the original strains were shown to liquefy serum, whereas after long subcultivation they had lost this power. This change in the power to liquefy serum may be associated with the change in toxicity which the organism develops after long subcultivation. Mason considers that the liquefaction of solid serum should not be applied as a major test in classifying a lamb dysentery-like organism. —E. M. Robinson.

Walkiewicz, W. (1934). Grzybica zoladka u swin. [**Gastromycosis of the Pig**]. —*Wiad. weteryn.* **13.** 449-463. 5 figs. on 2 plates. [7 refs.] [Abst. from French summary].

Three case records, well illustrated, of gastro-intestinal mycosis in pigs. In the first case two large lesions in the stomach were seen; they took the form of areas of greyish-green necrosis. Small similar foci were found in the intestine. The second case showed three small foci in the stomach and a few in the caecum and the third case showed large lesions in the caecum. The histology of the condition is given. Mycelia were found to have invaded the tissues, and even extended into the small blood vessels, many of which showed thrombosis as a result.

No cultures were prepared and the fungus could not be identified.—J. E.

DISEASES CAUSED BY PROTOZOAN PARASITES.

—. (1934). **Conference on Tsetse and Trypanosomiasis (Animal and Human) Research. Held at Entebbe 22nd to 25th November, 1933. Conference of Governors of British East African Territories.** pp. 42. Nairobi: Govt. Printer. [8vo].

This conference, which was attended by medical, veterinary and entomological representatives of Kenya, Tanganyika and Uganda, and also by delegates from Nyasaland and the Belgian Congo, was opened by the Governor of Uganda. He

pointed out that the object of the conference was to foster the co-ordination of research on trypanosomiasis by devising better means of disseminating, throughout the three territories, the knowledge acquired in any one of them and, by avoiding unnecessary duplication, to make the greatest use of the financial resources available.

The programme of research was discussed, based on the suggestions of the international conference on sleeping sickness and on suggestions submitted by investigators in the East African Territories. Investigations are to be continued into the immunity of man and his natural recovery from *Tryp. gambiense* and *T. rhodesiense* infections, the immunity of certian monkeys to these infections and the behaviour of these trypanosomes in relatively resistant ruminants and game. Further work is to be carried out on the retention of acquired characteristics by trypanosomes during cyclic evolution ; this is to be extended to work on strains of *T. congolense* and *T. vivax*, particular mention being made of strains of the former parasite, which appears to exhibit a resistance to treatment. Amongst other researches planned, work on the identity of *T. uniforme*, the bionomics and pathogenicity of *T. brucei*, the cultivation of *T. congolense* and *T. vivax* and an investigation into trypanosomiasis of pigs, are of particular veterinary importance.

The methods of the control and eradication of tsetse fly were very fully discussed, and the report includes a memorandum by Swynnerton, briefly reviewing the progress made up to the present in tsetse fly control and the programme for next year. Great stress was laid on the protective value of concentration of population and the eradication of tsetse infestation by systematic rural development. Concentration developments in Tanganyika are based on unit communities of 1,000 families, 5,000 cattle, 25,000 acres and a dipping tank. For the successful establishment of such communities in tsetse areas the co-operation of medical, entomological, veterinary, agricultural and forestry experts is required.

Research on the transmission of trypanosomiasis by other biting flies is to be continued, and the report contains an interesting statement by Lambourn that, by studying the conditions required for breeding, he is now able to obtain as many Tabanidae, Haematopota, Stomoxys, Lyperosia and Haematobia as he requires.

—U. F. Richardson.

Cordier, G., & Menager, J. (1934). Etude sur la dourine. [**Dourine (In Tunis)**]. —*Rev. vét., Toulouse.* **86.** 185-201. [4 refs.]

This paper gives an account of the symptoms and lesions of dourine in the horse and donkey, and discusses the efficiency of methods of diagnosis and treatment. The absence of clinical symptoms in donkeys, particularly donkey mares, is emphasized. Diagnosis in the early stages of the disease can be confirmed by microscopic examination of the blood or oedematous exudates, or by subinoculation into the testicle of a guinea pig.

Serological methods of diagnosis have not proved very satisfactory. The various precipitation tests and the formol-gel test gave irregular results, and an attempt to produce anaphylactic shock in guinea pigs, by injecting the bodies of trypanosomes together with the serum of an infected animal, proved a failure. For the complement-fixation test, Watson's antigen was considered unsatisfactory, owing to the delicacy required in its preparation and the difficulty in its preservation. Tissue antigens of the heart, liver and spleen of infected animals were tried and gave fairly good results, but a difficulty was encountered in the antihaemolytic property of some of the donkey sera.

Various drugs (tartar emetic, " atoxyl " and " naganol ") can be used for treatment, but it is always doubtful if recovery will be complete, and infected male animals should be castrated. Preventive treatment with " naganol " appears to

be satisfactory, but attempts to protect donkey stallions were abandoned owing to their severe reaction to the drug treatment.—U. F. Richardson.

Virviescas, F. (1934). Tripanosoma theileria y babesiella en la sangre de un bovino de Valle del Cauca. [*Tryp. theileri* **and Babesia in the Blood of a Bovine from Valle del Cauca**].—*Rev. Med. vet., Bogotá.* **6.** 898-901. 1 fig., 1 table.

The author reports the identification of *T. theileri* in smears from a bovine that had died of babesia (babesiella of author) and anaplasma infections. He also reports spirochaetosis in two young bulls; the parasite was probably *Spirillum theileri.* Both parasites were from animals in a district of Colombia in which piroplasmoses are so prevalent that animals introduced from tick-free areas have to be previously immunized.—R. S. Roberts.

Launoy, L. (1934). Incubation clinique et pouvoir infectant du sang, dans l'infection expérimentale à *Trypanosoma congolense* du Cobaye. [**Clinical Incubation and Infective Power of the Blood in Experimental Infection of the Guinea Pig with** *T. congolense*].—*C. R. Soc. Biol. Paris.* **117.** 1047-1049. 1 table. [1 ref.]

It was found that, on inoculating guinea pigs with a dose of 70,000 trypanosomes, the blood became infective in 24 hours, although flagellates could not be detected in the blood microscopically for six days or more. On decreasing the dose to 11,750 organisms, the blood did not become infective until 30 hours later. The author points out that this lengthening of the " bacteriological incubation " period might be due to injury of the trypanosomes during the process of dilution employed to reduce the number of organisms injected.—U. F. Richardson.

Corson, J. F. (1934). **The Influence of the Dose of Trypanosomes and of the Body Weight in Experimental Infections of White Rats with** *Trypanosoma rhodesiense.*—*Ann. trop. Med. Parasit.* **28.** 525-534. 7 tables. [13 refs.]

From experiments on white rats, varying in weight between 50 and 100 g., with doses of trypanosomes varying between 100 and 100,000, it is concluded that neither the body weight nor the dose of the trypanosomes had an important influence on the disease, though an extremely minute dose of parasites may be followed by a longer incubation period than occurs after a heavy infection. A comparison of infections produced by inoculation, and by the bites of tsetse flies infected with the same strain of trypanosomes, showed a considerable degree of uniformity.

Attention is drawn to the difficulty in estimating the dose of a heterogeneous strain of trypanosome, the complications introduced by the effect of the diluting fluid, and the reduction of the dose which may be caused by the attachment of trypanosomes to leucocytes. In two experiments in which the trypanosome dilutions were made with Ringer glucose solution, doses estimated at 100 trypanosomes failed to cause infection, but, with sheeps' blood serum added to the diluting fluid, the same estimated dose infected in every case after an incubation period of only six days.—U. F. Richardson.

Mackie, F. P. (1935). **The Jarisch-Herxheimer Reaction in Trypanosomiasis. With a Note on the Morular Cells of Mott.**—*Trans. R. Soc. trop. Med. Hyg.* **28.** 377-384. 7 figs. on 2 plates. [25 refs.]

The Jarisch-Herxheimer reaction occurs typically as a reaction of syphilitics to primary drug treatment, and varies in severity from a slight rise of temperature

to the occurrence of alarming symptoms, such as violent headache, vomiting, tremors, convulsions, coma and death. The effects on the central nervous system may be meningeal congestion with punctate haemorrhages, or haemorrhagic encephalitis. A genuine Jarisch-Herxheimer reaction occurs in human trypanosomiasis, but this reaction has been confused with the therapeutic catastrophies which are due to toxic alteration of the drug used, and the optic trouble associated with the use of tryparsamide may be due to either cause. It has been suggested that this toxic change can be avoided by the use of freshly distilled water and strict attention to asepsis in the preparation of the tryparsamide solution.

The morular cells of Mott are discussed in connection with a case of sleeping sickness, in which they were especially numerous. Their origin has been ascribed to neuroglia, plasma cells and even to trypanosome degeneration, but the writer confirms that they may be found outside the central nervous system ; this fact excludes the assumption that their origin is invariably from neuroglia cells.

—U. F. Richardson.

Witte, J. (1934). Serologische Untersuchungen zum Nachweis der Trichomonadeninfektion der Genitalien des Rindes. [**Serological Diagnosis of Genital Trichomonad Infection in Cattle**].—*Berl. tierärztl. Wschr.* **50.** 693-695. 2 tables. [6 refs.]

This article records investigations into the value of pure cultures of genital trichomonads as antigens in the serological diagnosis of trichomonad infection in cattle. Using an extract of trichomonads from a serum-broth culture as antigen for the complement-fixation test, the sera of infected animals gave a large majority of positive reactions, whilst normal sera and the sera of animals infected with tuberculosis and contagious abortion gave uniformly negative reactions. The sera of normal cattle were found to agglutinate a suspension of trichomonads from culture but, in guinea pigs, normal animals could be distinguished from infected animals by the agglutination test. No evidence of a variation in the antigenic value of different strains of the trichomonad could be detected.

Rieckenberg's blood platelet attachment reaction, exhibited in trypanosomiasis, could not be demonstrated in genital trichomoniasis.—U. F. Richardson.

Tyzzer, E. E. (1934). **Studies on Histomoniasis, or " Blackhead " Infection in the Chicken and Turkey.**—*Proc. Amer. Acad. Arts Sci.* **69.** 189-264. 6 plates, 11 tables. [25 refs.]

This paper summarizes our knowledge of histomoniasis and records important new work by Tyzzer. Mass production of turkeys has been made possible in America by avoidance of the two chief sources of infection, namely, mature poultry and contaminated soil, and by using incubators and brooder houses. Thus proper management is sufficient for commercial success. [Tyzzer has reared healthy turkeys for market in the midst of infected birds by efficient management alone. See also his negative results with various drugs and limited success with arsenical preparations].

In young turkeys blackhead is progressive and therefore usually fatal ; in young hen-chicks it is usually brief and mild and recovery follows, but the recovered bird becomes a carrier, its discharges being infective for indefinite periods, although no phase of *Histomonas* is known to be capable of survival longer than very short periods outside the host. Apart from hen-chick carriers, usually only the discharges of acute cases are infective. Spontaneous blackhead in young turkeys exposed to poultry or to older turkeys is generally due to their ingestion of embryonated eggs of *Heterakis gallinae* [vesicularis papillosa], which can transmit

histomoniasis although the protozoan has not been found in the egg but only in the intestinal cells of hatched worms about 11 days old ; non-embryonated eggs do not transmit the disease. The damage to the caecal mucosa caused by mature *Heterakis* does not assist the entry of *Histomonas*.

Forms of typhlitis readily mistaken for blackhead are described. *Histomonas* may be present without lesions visible to the eye. In hen-chicks and turkeys, protected from infection and kept free from other protozoa, blackhead has been experimentally produced by feeding or by cloacal injection of liver and caecal lesions from acute cases, caecal discharges of carriers, cultures of *Histomonas* and embryonated *Heterakis* eggs or by intravenous, subcutaneous, intramuscular (into the breast) and conjunctival inoculation of aseptically obtained liver lesions. Tables 1 to 6 record details. Cloacal injection is the most reliable method. Breast inoculation produces a local lesion, like that of the natural disease, containing *Histomonas*, with metastases in turkeys in the lungs, liver, kidneys, etc., provided that the strain of *Histomonas* used is sufficiently virulent. There is no satisfactory evidence that *Histomonas* can be transmitted through the turkeys' or hens' eggs.

The paper contains the only adequate description of *Histomonas*, amplifying Tyzzer's earlier accounts and adding photographs, drawings and a fuller description of its morphology in cultures, caecal discharges and the tissues. Drbohlav first cultivated it from caecal discharges of hen-chick carriers ; it has never been cultivated from other sources. Tyzzer describes his refinements of the original method and establishes the flagellate affinities of *Histomonas*. Cloacal injection of these cultures causes blackhead more regularly in young hen-chicks than in young turkeys. All the cultures contain caecal bacteria, but cloacal injection of cultures frozen overnight at –15°C. failed to cause blackhead and it is claimed that *Histomonas* is alone the cause of the disease.

These cultures have immunizing properties. *Histomonas* does not change morphologically in them, but their virulence alters. Of the three strains studied, one strain remained virulent for 11 months, but after 23 months became almost non-pathogenic ; another became non-pathogenic after 16 months in cultures ; the third was still fully virulent after nearly ten months. One such attenuated strain immunized young hen-chicks and turkeys kept under experimental conditions against recently isolated fully virulent strains. After another 12 months in cultures the strain lost its immunizing properties ; rapid passages of it through five lots of young hen-chicks and five young turkeys failed to restore its virulence. Small flocks of young turkeys, 29 in the largest group, were thus protected and reared for market on land which had in previous years never failed to produce blackhead. This protection may be lost in two or more months. The best immunity was obtained by following the initial cloacal injection of an attenuated strain with one of a virulent strain several weeks later. Attempts to immunize mature turkeys, one year old or so, failed.

Strains perhaps vary in virulence in nature, so that experimental results may vary with the natural strain used. The virulence does not depend on the associated caecal bacteria. Histological evidence shows the immunity to be due to slight non-progressive invasion of the tissues by *Histomonas*, detectable in sections but not to the naked eye ; loss of immunizing properties seems to be associated with loss of the protozoan's invasive powers. Young turkeys recovered promptly from inoculations with attenuated strains, so that loss of virulence does not necessarily mean a more chronic disease. Cloacal injection of cultures was used for these experiments ; tables 7 to 11 record details of them. The serious obstacles to the use of this method of immunity for control in the field are discussed.

—G. Lapage.

Lee, C. D. (1934). **The Pathology of Coccidiosis in the Dog.**—*J. Amer. vet. med. Ass.* **85.** 760-781. 6 figs., 4 tables. [21 refs.]

Employing a modification of Sheather's sugar floatation method, the author isolated a number of species of coccidia from dogs. They were identified as *Isospora bigemina*, *I. rivolta* and *I. felis* according to their morphology and physiological behaviour in culture. By cross-infection experiments it was found that these coccidia were infective for dogs and cats and that *I. bigemina* was also capable of infecting foxes. The three species studied were not so resistant to extremes of temperature and putrefaction as is generally believed. Mercuric chloride, mercuric iodide and steam were effective in destroying non-sporulated oocysts. The author records the appearance of a blood-stained diarrhoea, accompanied by rapid emaciation, extreme anaemia and weakness, four days after the artificial infection of dogs with coccidia, but the relative pathogenicity of each species is not clearly stated. The elimination of oocysts commenced on the sixth or seventh day following artificial infection and continued for 15 to 22 days. The pathological changes were limited to the small intestine and were those of loss of surface epithelium with leucocytosis and haemorrhage. One infection produced partial resistance to later infection, but repeated small daily doses of coccidia produced complete permanent immunity.—F. Blakemore.

Mayhew, R. L. (1934). **Some Practical Results of Experiments on Coccidiosis in Chickens.**—*Circ. La agric. Exp. Sta.* No. 7. pp. 4. [Copied *verbatim* from *Exp. Sta. Rec.* **71.** 394-395].

A brief practical account of control measures for avian coccidiosis. Experiments at the station show that " birds which have had a severe attack of the disease never become profitable because (1) they do not attain normal weight within 5 to 6 mo. after the attack, (2) they do not begin to lay until $6^1/_2$ weeks older (on the average) than uninfected birds, and (3) they lay only about one half as many eggs as the uninfected birds.

" Numerous and careful experiments show that during the 3 mo. following the attack of coccidiosis there is an actual loss in profits to the poultryman of from 10 to 40 per cent. due to the slower rate of growth. In one of these lots at the time the 25 cockerels weighed 2 lb. each. This loss was 14 per cent. of the profit and the total loss from the epidemic, including loss by death, amounted to $3.50, a considerable part of the feed costs for the lot ".

In an experiment conducted birds that had been severely affected laid only 54·5 per cent. as many eggs as those not affected. Sexual maturity was also delayed $6^1/_2$ weeks in the severely attacked group, which necessitated extra feed and labor expenditures before laying began.

Dikmans, G. (1935). **Canine Babesiasis in the United States.**—*N. Amer. Vet.* **16.** No. 1. 45-48. 1 fig. [9 refs.]

This article discusses the report of the detection of *Babesia canis* in a dog in Florida, where the existence of this parasite had not previously been recorded. The author expresses a doubt whether the specific identity of the parasite can be determined with the material available, and considers that further work should be undertaken on the identity of the parasite and its relationship to haemolytic jaundice, a disease of dogs somewhat prevalent in parts of the United States.

A short review is given of the literature dealing with the species of babesia which occur in dogs, their transmission and the treatment of *B. canis* infections with trypan blue and " trypaflavine ". It is suggested that the Florida organism may be transmitted by *Rhipicephalus sanguineus*, the invertebrate vector in India, or by *Dermacentor variabilis* which is nearly related to *D. reticulatus*, the vector of European strains of the parasite.—U. F. Richardson.

Carré, H., & Richard. (1934). La piroplasmose vraie du Cheval dans la Nièvre. [**True Equine Piroplasmosis in the Nièvre District—France**].—*Rec. Méd. vét.* **110.** 663-668.

A peculiar form of " fièvre typhoide ", occurring in spring and autumn, has been recognized in the Nièvre district for five years, but it was not until 1934 that blood smears were examined and the causal organism, *Babesia caballi*, detected. The most prevalent tick of this area is *Dermacentor reticulatus*. A number of cases of the disease are recorded and the authors remark that the classical symptoms of fever, jaundice and haemoglobinuria may not all be present in the same animal. Haemoglobinuria was the most constant symptom. When jaundice was severe, fever was slight, and mild jaundice was associated with high fever. Dysphagia was sometimes so marked that the owners often suspected the animal of choking. For treatment, " gonacrine " was preferred to trypan blue which in some cases caused symptoms of shock. Sulphate of soda and strychnine were also administered, and milk is recommended as a diuretic.

The prevalence of the disease in stallions is very high and the authors suggest that it may be contracted during the service of mares which have become carriers of the organisms.—U. F. Richardson.

Yakimoff, W. L., & Sokoloff, I. I. (1934). Die Sarkozysten des Renntieres und des Maral (*Sarcocystis grüneri* n. sp.). [**Sarcocysts of the Reindeer and Maral**].—*Berl. tierärztl. Wschr.* **50.** 772-774. 2 figs., 3 tables. [5 refs.]

The authors confirm the existence of sarcocyst infection in reindeer in Russia and record the detection of an infection in marals which was associated with a chronic disease, though the aetiological connection was doubtful. Although it is admitted that it is probable that these sarcocysts of the reindeer and maral are identical with those of cattle, the authors propose to name them *S. grüneri* to indicate their existence in a different species of host.—U. F. Richardson.

DISEASES CAUSED BY VIRUSES.

Curasson, G. (1934). La peste bovine dans l'Afrique occidentale française pendant l'année 1933. [**Rinderpest in French West Africa in 1933**].—*Bull. Off. internat. Epiz.* **9.** 2-12.

In view of the provision of extra funds and staff for the vigorous anti-rinderpest campaign planned to commence in the French West African colonies in 1934, Curasson reviews the position in regard to the prevalence of the disease and the methods used for combating it in 1933.

The position in the seven colonies varies from an enzootic condition in some, to comparative freedom, with occasional epizootics, in others.

The general policy adopted has been a double inoculation of cattle at the outbreak centre, and a vaccine-virus treatment of cattle to which it is wished to give a preventive immunity. The immunity conferred by formolized vaccine alone only lasts eight months and this method of protection is not advocated, except to obtain the confidence of native owners. The system of preparing vaccine in the field has been largely adopted as it has the advantages of allowing preparation for immediate use, and ensuring that the vaccine is of the same virus strain as the disease against which it is required. Owners desirous of protecting their herds will supply calves for the manufacture of vaccine and, by close co-operation with the veterinary officer in preparing it, gain confidence in the method. Experiments were undertaken which indicate that even animals in the late stage of the disease

will provide satisfactory vaccine ; whilst samples were found to be still efficient up to 73 days, they were of no value after 117 days. The samples under test were made with 10 per cent. formol which is a higher concentration than that usually recommended.—U. F. Richardson.

Walker, J. (1934). **Some Observations on Foot and Mouth Disease in the Bechuanaland Protectorate.**—*J. S. Afr. vet. med. Ass.* **5.** 73-91. 4 tables.

Foot and mouth disease broke out in the Bechuanaland Protectorate in January, 1933. A general inoculation campaign with virulent material alone was undertaken in order to allow the disease to spread as rapidly as possible – the only method of combating it in a sparsely populated country with 1,500,000 cattle, mainly owned by natives. The method of transmission used in the campaign was intranasal injection of infective blood, as recommended by Bevan in Southern Rhodesia. The author introduced a method of intramucosal inoculation of vesicle virus which was found to be particularly useful for calves. After August, 1933, no further cases of foot and mouth disease occurred. Foot lesions were seen in wildebeest (gnu) that came in contact with infected cattle, but no work was done on the possible transmission by game. The virus was typed at Weybirdge, England, as a variant of the O type, and was of low pathogenicity. Vesicle virus in preservative fluid maintained its infectivity for 21 days at 68°C.—E. M. Robinson.

Poillon, C. H. (1934). La fièvre aphteuse. Sa prophylaxie. Quelques observations sur l'emploi du sérum anti-aphteux. [**Serum Immunization against Foot and Mouth Disease**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 78. 1 plate, 4 charts. [36 refs.]

After seven years of clinical trial, the author has reached the opinion that convalescent serum or, better still, polyvalent hyperimmune serum is of distinctly palliative value in the treatment of foot and mouth disease, where that condition is epidemic. Dosage is heavy, namely, 40 c.c. per 220 lb. body weight for the cow (minimal quantity 200 c.c.), 50 c.c. for the pig and 30 c.c. for sheep. Prophylactic doses must be administered every 10 to 12 days, whilst curative injections should be given weekly or bi-weekly, according to the clinical picture. The author describes the results of treating 331 animals with serum.—J. W. Emslie.

Helm, R. (1933). Die Differenzierung der Virustypen der Maul- und Klauenseuche durch die Komplementbindung. [**Differentiation of Types of Foot and Mouth Disease Virus by Complement-Fixation**].—*Zlb. Bakt. I. (Orig.).* **130.** 305-312. 3 tables. [11 refs.]

A filter-paper filtrate of vesicle fluid in glycerin saline was used as antigen. Sera from normal guinea pigs and from guinea pigs infected with types A, B and C virus were tested against A, B and C antigen, 1,008 samples of serum being tested. In the course of the investigation it was found that fluid from a 24-hour-old vesicle gave better antigen than that from one 48 hours old. It proved possible to type samples of infected serum by the complement-fixation test, using specially prepared antigen from the three strains of virus.—E. J. Pullinger.

Wagener, K. (1934). Stomatitis vesicularis und Maul- und Klauenseuche. Eine kritisch-experimentelle Vergleichsstudie. I. Mitteilung. Aetiologie, Virusbiologie, klinische Erscheinungen. II. Mitteilung. Wechselbeziehungen zwischen Virus in Tierkörper. [**Vesicular Stomatitis and Foot and Mouth Disease. Pts. I & II**].—*Arch. wiss. prakt. Tierheilk.* **66.** 173-188 and 301-316. 1 table. [72 refs.]

Foot and mouth disease and vesicular stomatitis have much in common. They are characterized by vesicle formation on the mucous membrane of the alimentary tract and on the skin of the extremities. The diseases also show a clinical resemblance, both passing through the phases of primary vesicle formation, fever reaction and secondary vesicle formation. Generalization is, however, less common in vesicular stomatitis, and it must be remembered that horses contract this latter condition.

Histologically, no true distinction can be drawn between the two conditions. Both infections show plurality of virus. [It is possible that the technique for cultivating the virus of vesicular stomatitis on the chorio-allantoic membrane of eggs, described by BURNET and GALLOWAY – this *Bull.* **4.** 726. – may lead to a simple and rapid method of distinguishing this virus from that of foot and mouth disease].—E. J. PULLINGER.

STENIUS, P. I. (1934). Hevosen tarttuvan näivetystaudin toteaminen, varsinkin patologis-anatomiselta kannalta katsottuna. [**The Diagnosis of Equine Infectious Anaemia**].—*Suom. Eläinlääkril.* **40.** 154-158 and 182-186. [Abst. from German summary].

A discussion of the difficulties in the differential diagnosis of equine infectious anaemia from anaemia due to other causes.

The anaemia which occurs in the virus infection cannot be differentiated by microscopic tests from anaemia due to other causes, and transmission tests on healthy horses must be used for accurate diagnosis.—J. E.

RAMON, G., & LEMÉTAYER, E. (1934). Pénétration du virus de l'anémie infectieuse des Equidés au niveau des plaies et de la conjonctive. [**The Penetration of the Virus of Equine Infectious Anaemia through Wounds and the Conjunctiva**].—*C. R. Soc. Biol. Paris.* **116.** 915-917. [1 ref.]

Following up their previous work on this subject [see this *Bull.* **5.** 268.] the authors report two further cases of the experimental transmission of infectious anaemia to healthy horses. On May 8th virulent blood was sprayed on to a skin wound of one horse and into the conjunctival sac of another. Both horses developed the disease on June 19th.—C. DAVENPORT.

SOBRA, K. (1933). O reakci koní s inf. anemií na subkutánní injekci tuberkulinu. [**Reaction of Horses with Infectious Anaemia to Subcutaneous Injections of Tuberculin**].—*Zvcrolék Rozpravy.* **7.** 239-240 and 257-263. 1 fig. [4 refs.] [German summary : abst. from orig.]

In the brief introductory part of this paper the author summarizes the literature dealing with the use of the tuberculin test for the diagnosis of infectious anaemia in horses.

He carried out experiments with Koch's tuberculin on 20 horses affected with infectious anaemia. In some horses an ophthalmic test was made simultaneously. Six horses (30 per cent.) gave a positive reaction (increase of body temperature above 39°C.). The ophthalmic tests were negative. The conclusion drawn is that the positive subcutaneous tuberculin test may be of service for the diagnosis of infectious anaemia in horses in doubtful cases and may be considered as further help in clinical diagnostic methods. [There does not appear to be any justification for the views expressed by the author.—Ed.]—E. PRIBYL (BRNO).

NIESCHULZ, O. (1933). Ueber Infektion von Mäusen mit den Virus der Südafrikanischen Pferdesterbe. [**Infection of Mice with the Virus of African Horse-Sickness**].—*Zlb. Bakt. I. (Orig.).* **128.** 465-482. 5 figs. [5 refs.]

The author has shown that it is possible to infect mice with the virus of African horse-sickness by intracerebral inoculation of material from infected horses. Twenty-four passages were carried out in the mouse, and it was thus shown that infection could easily be transmitted from mouse to mouse. Fresh virus was not always fatal to mice, but after about six passages the virulence became enhanced and all inoculated mice died after an incubation period of about six days. Virus is definitely neurotropic, remaining in the brain until death, and cannot be recovered from other tissues. Recovery from infection, which may occur with fresh virus, is followed by an immunity which lasts for at least four months. Mice are not infected by subcutaneous or intravenous inoculation. Intraperitoneal inoculation produces no disease but may produce immunity. Infected mice show lameness, and the histopathological picture is one of encephalitis with round-cell infiltration. Suspensions of infected mouse brain, inoculated intravenously into a horse, produced typical horse-sickness. [This investigation, which was followed by a further series, abstracted in this *Bull.* **4.** 32 and 164 and **5.** 75 and 133, opened an entirely new field for research on the virus, and resulted in a new and efficient method of preventive inoculation].—E. J. Pullinger.

Kelland, P. J. L. (1933). **Swine Fever—Government Measures in Great Britain.** —*Pig. Breed. Annu.* **13.** 64-67.

A brief review is given of the various policies which have from time to time existed in order to control swine fever. The present policy consists of the adoption of the following measures :–

(a) Reporting of suspected cases and arrangement for diagnosis.

(b) Slaughter is ordered by the Ministry of Agriculture only so far as it may be necessary to make a diagnosis.

(c) Complete isolation of infected herds until disease is eradicated.

(d) Facilities are given for serum treatment by the owner's veterinary surgeon to apparently healthy pigs if so desired by the owner.

(e) Encouragement for the owner to slaughter all fat pigs remaining in infected places.

(f) General detention for a period of 27 days at the place of destination of all pigs moved from markets or from pig dealers' premises within the scheduled area or of pigs moved out of the scheduled area unless licensed for slaughter. The scheduled area includes the greater part of England.

(g) Special " infected area " restrictions are imposed in districts where the disease may become unusually prevalent.

A review of the outbreaks of swine fever shows that during the period of the present policy (1923 to 1932) the average number per annum is 1,849 compared with 2,709 during the period when slaughter was enforced and over 4,000 per annum when the disease was dealt with by local authorities and not by the Ministry of Agriculture.

Notwithstanding this, it is recognized that there is urgent need for extended research work in connection with swine fever and other diseases of pigs.

—R. Lovell.

Lestoquard, F. (1934). Un siècle de peste porcine. [**A Century of Swine Fever**]. —*Rev. vét., Toulouse.* **86.** 686-690. [1 ref.]

Swine fever has been recognized for over a century in America and, in spite of the control methods employed, is as prevalent as ever. Poor quarantine measures, the extensive transportation of pigs and the improper use of virus are the three chief causes of the prevalence of the disease.

The author suggests two methods of control, total eradication or limitation of economic losses. The latter method can be done in three ways, by vaccination of all stock, by isolation and disinfection, or by a combination of these two methods. —N. H. Brooksbank.

Röhrer, H., & Graf, A. (1934). Die Bedeutung des " selbständigen encephalitischen Symptomenkomplexes" für die histologische Diagnose der chronischen Schweinepest. [**The Significance of an Encephalitic Syndrome for the Histological Diagnosis of Chronic Swine Fever**].—*Dtsch. tierärztl. Wschr.* **42.** 637-643. 4 figs.

After examining the brains of different groups of pigs by histological methods, the authors come to the following conclusions.

In 40 per cent. of 25 normal slaughtered swine, changes were found in the central nervous system. There was an increase in the adventitia cells of the small vessels, collections of glia cells and groups of lymphocytes.

Of 30 swine sent in for *post-mortem* examination, mostly unthrifty but not suspected of swine fever, 33 per cent. also showed these lesions. The changes in these two groups were not truly inflammatory, bore no relationship to the true encephalitic syndrome and were regarded as pseudoencephalitis. In four unthrifty pigs from two herds with a previous history of acute swine fever, the brains showed definite encephalomyelitis, characterized by advanced cellular infiltration of the walls of the blood vessels and a diffuse glia proliferation, said to be the characteristic brain lesion in swine fever. The encephalitic syndrome was marked.

For the certain histological diagnosis of swine fever, there must be a more or less diffuse appearance of the encephalitic syndrome and the presence of true encephalitis.—A. W. N. Pillers.

I. Michalka, J. (1934). Beitrag zur Wertbestimmung des Schweinepestimmunserums. [**Standardization of Swine Fever Serum**].—*Wien. tierärztl. Mschr.* **21.** 161-169. 5 tables. [11 refs.]

II. Ganslmayer, J. H. (1934). Beitrag zur Wertbestimmung des Schweinepestimmunserums. [**Standardization of Swine Fever Serum**].—*Ibid.* 353-359.

I. Methods adopted for the standardization of swine fever antiserum in America, Hungary, Yugoslavia and the U.S.S.R. are described. The principle underlying all standardization consists of the simultaneous inoculation of a test dose of virus (of known virulence) with a protective dose of 0·5 to 1 c.c. of antiserum per kg. body weight. Pigs of an approximate standard weight are inoculated. Depending upon the standard in different countries, none or very few of the pigs should show sickness and none should die when suitable doses are given.

The author compared eight samples of sera from America and various European institutes. Six of these had very similar protective action, with titres of 0·5 c.c. per kg. body weight. The other two samples appeared less satisfactory. He suggests the following method of standardizing sera for universal adoption. Three pigs to be inoculated with 2 c.c. of virus and 0·25 c.c. of serum per kg., three with virus and 0·5 c.c. serum per kg., three with virus and 0·75 c.c. serum per kg. and three with virus alone. All pigs in the last group should sicken within four days and die within 21 days. If any animal which has received virus and serum develops a temperature of 40·5°C. within 48 hours, that batch of serum should be discarded. Final standardization would aim at a titre of 0·5 c.c. per kg.

II. The author describes the American, Hungarian and Yugoslavian methods

of immunization against swine fever. To protect the veterinary practitioner, it is desirable that firms marketing antiserum should give a guarantee of the reliability of the product in question. Such a guarantee should include the following points :– (1) that no carriers of infection result from the vaccination ; (2) that no death or sickness results from vaccination and that 100 per cent. immunity is produced in swine fever-free herds, and (3) that, in infected herds, 90 per cent. of the vaccinated animals remain free from swine fever.—E. J. Pullinger.

U.S.A., State of Nevada. (1934). **Biennial Report of the State Rabies Commission for the Period July 1, 1932 to June 30, 1934, Inclusive.** [Records, E.] pp. 8. Carson City : State Printing Off. [8vo].

A financial and statistical report, showing that the total cost of the control of predatory animals during 1932 to 1934 was $69,784, and that 8,334 predatory animals were destroyed in the two years. Out of 19 examinations for rabies, eight positive and nine negative results were obtained, two specimens being unfit for examination. The highest number of positive results was 151 in 1916.

—F. Bullock.

Sabri, B. (1934). Vergleichende Untersuchungen über verschiedene Immunisierungsverfahren bei Wut. [**Immunization against Rabies**].—*Inaug. Diss. Vienna.* [Abst. from abst. in *Wien. tierärztl. Mschr.* **21.** 648-649].

The author carried out comparative tests on the Högyes, Fermi and Alivisatos methods of immunization against rabies, using rabbits.

Immunity, as judged by an infection test, developed soonest after the Alivisatos method and latest after the Högyes method. Antibodies were demonstrable in the blood about ten days after the last injection of vaccine with either method, but their incidence was not completely bound up with the degree of immunity, as immunity to intracerebral infection was not acquired until a short time after the appearance of antibodies.

On the other hand, every animal immune to rabies possesses antibodies in abundance.

The duration of immunity was not followed up owing to the cessation of observations, but immunized rabbits were still immune five months, 75 days and 60 days after the Högyes, Fermi and Alivisatos methods respectively.

The behaviour of rabbits to immunization by various routes is described.

—J. E.

Haupt, H. (1934). Die durch Fledermäuse verbreitete Tollwutseuche unter Rindern und Pferden Südbrasiliens. [**Rabies of Cattle and Horses in South Brazil Transmitted by Bats**].—*Tierärztl. Rdsch.* **40.** 658-659.

This is a reference to the diseases of livestock in various parts of South and Central America, which have been diagnosed as rabies.—J. E.

Jonnesco, D. (1934). Contribution à l'étude de la maladie d'Aujesky. [**Aujeszky's Disease—Infectious Bulbar Paralysis, Pseudorabies, Mad Itch**]. —*Ann. Inst. Pasteur.* **53.** 554-563. [5 refs.]

A more detailed account of an article previously noted [this *Bull.* **4.** 731]. A strain of Aujeszky's disease, recovered from a dog, was virulent in 100 per cent. of animals susceptible to infection. It was found that passage of the virus through the fowl or pigeon resulted in a marked attenuation in virulence. In the fowl, after intramuscular inoculation, the virus persisted in the blood stream, although

the birds appeared quite healthy. The blood from such cases inoculated intracerebrally into rabbits frequently produced a fatal " autosterilizable " disease.

In the dog, the condition induces a marked leucocytosis (up to 25,000) coupled with the appearance of plasma cells. The occurrence of large areas of fatty degeneration in the myocardium is regarded as a characteristic lesion.—R. E. Glover.

Remlinger, P., & Bailly, J. (1934). Contribution à l'étude de la nature du virus de la maladie d'Aujeszky. [**Aujeszky's Disease—Pseudorabies, Infectious Bulbar Paralysis, Mad Itch**].—*C.R. Soc. Biol. Paris.* **117.** 409-411. [1 ref.]

The authors suggest that certain characters of the virus of Aujeszky's disease bring it (and possibly other viruses) into a class of colloidal substances just superior to the inorganic compounds. The virus of Aujeszky's disease readily diffuses into Locke's solution and thence into normal tissues ; moreover, it has so far proved impossible to sediment the virus by prolonged centrifugation ; in these respects it resembles toxins and diastases. The transmission of the disease in series and the difficulty in obtaining infective filtrates, on the other hand, suggests a close relationship with the bacteria.—R. E. Glover.

Sabin, A. B. (1934). **The Immunological Relationships of Pseudorabies (Infectious Bulbar Paralysis, Mad Itch) [Aujeszky's Disease].**—*Brit. J. exp. Path.* **15.** 372-380. 4 tables. [8 refs.]

In a recent article, Sabin [this *Bull.* **5.** 138.] has shown a slight immunological relationship between B virus, Aujeszky's disease and herpes simplex. In the present investigation, a series of rabbits immune to herpes was tested intracutaneously with the virus of Aujeszky's disease. The animals died in the same space of time as the controls. It was thought that, on account of the high susceptibility of the rabbit to this disease, partial relationships might be detected with greater facility in the guinea pig. On repeating the experiments in this animal, four out of 14 herpes-immune guinea pigs were resistant to small doses of the virus of Aujeszky's disease (all the controls died), although these animals ultimately succumbed when tested with larger doses.

Certain hyperimmune anti-herpes sera also protected guinea pigs against similar small doses of the virus of Aujeszky's disease, but a potent anti-Aujeszky serum failed to protect against herpes. These data are held to indicate, although they do not prove, a relationship between herpes and Aujeszky's disease.

—R. E. Glover.

Nieschulz, O. (1934). Proeven met het virus van de blauwtong der Zuid-Afrikaansche schapen in muizen. [**Susceptibility of Mice to Blue Tongue Virus**].—*Ned. Tijdschr. Hyg.* **8.** 189-193. [1 ref.] [Abst. from German summary].

The author was unable to infect mice with the virus of blue tongue from sheep either by intracerebral or intraperitoneal inoculation. Mice are thus unsuitable as experimental animals with this virus.—J. E.

Boughton, I. B., & Hardy, W. T. (1934). **Contagious Ecthyma (Sore Mouth) of Sheep and Goats.**—*J. Amer. vet. med. Ass.* **85.** 150-178. 2 figs., 4 tables. [22 refs.]

This condition is described as a " specific contagio-infectious " disease, which is characterized by the formation of papules, vesicles and scabs on the skin of the lips. It occurs only in sheep and goats and cannot be reproduced in any other

species of animal. Lambs and kids are principally affected, but lesions of a milder form are often seen in adult animals.

It is considered that the disease, as contagious pustular dermatitis, contagious pustular stomatitis, lip and leg ulceration or " chancre du mouton ", occurs in many parts of the world and has been studied by several investigators.

The authors state that in Texas the death rate may be considerable, due to the infestation of the swollen inflamed lips with the larvae of *Chrysomyia* [*Cochliomyia*] or those of other blowflies. Their experiments have confirmed the findings of other investigators, in that a filtrable virus has been found to be responsible for the condition. *Staphylococcus aureus* was obtained in pure culture from the pustular fluid of typical lip lesions of both natural and experimental cases of sore mouth, but inoculation experiments showed that this organism had no aetiological significance. *Actinomyces necrophorus* was not found in any of the lesions examined.

As a result of the high degree of immunity which animals acquire following an attack of the natural or experimental disease, the authors carried out large scale field experiments, and found that of 7,884 vaccinated lambs, 30 developed mild lip lesions, while of 10,173 control lambs, 6,667 contracted the disease in a severe form.—D. R. Wilson.

Hartwigk, H. (1933). Vergleichende Untersuchungen über die Wirkung verschiedener zur Immunisierung gegen Hühnerpocken empfohlener Pockenimpfstoffe. [**Comparative Experiments on the Effect of Various Vaccines against Fowl Pox**].—*Arch. wiss. prakt. Tierheilk.* **66.** 381-392. 4 tables. [15 refs.]

Five vaccine preparations were compared. The virulence of all was so low that no disorder followed vaccination. Three of the products exerted no influence upon egg production ; the other two were not examined from that point of view. Vaccination with one sample was followed by 83 per cent. of positive reactions, the other four producing positive reactions in 50 to 72 per cent. of cases. Immunity to natural and to artificial infection was tested upon small groups of birds. Considering both classes of infection together, the best results were produced by fowl pox virus passaged through pigeons, which gave complete immunity in every case. Pigeon pox virus produced immunity in about half the cases, whilst the other types of vaccine produced complete immunity in 66 to 90 per cent. of cases.

—E. J. Pullinger.

I. Brandly, C. A. (1934). **Some Studies of Infectious Laryngotracheitis.**—*J. Amer. vet. med. Ass.* **84.** 588-595. 3 tables. [10 refs.]

II. Brandly, C. A., & Bushnell, L. D. (1934). **A Report of Some Investigations of Infectious Laryngotracheitis.**—*Poult. Sci.* **13.** 212-217. 4 tables. [11 refs.]

III. Beach, J. R., Schalm, O. W., & Lubbehusen, R. E. (1934). **Immunization against Infectious Laryngotracheitis of Chickens by " Intrabursal " Injection of Virus.**—*Ibid.* 218-226. 5 figs., 3 tables. [4 refs.]

I. Experiments were planned to determine the viability of the virus of laryngotracheitis in the yolk of egg, and the effect that it might produce when inoculated into eggs containing ten-day-old embryos.

The results appear to show that the virus of laryngotracheitis, within or upon the surface of the egg, does not seem to survive, except for short periods during incubation. Therefore the spread of the disease by means of eggs from infected or carrier hens does not seem to be important.

The development of normal chickens from infected or carrier flocks, as well

as from eggs artificially inoculated on the tenth day of incubation, further indicates that the danger of infection by the egg is not significant.

Further experiments support the field observations that laryngotracheitis infection in a flock may directly or indirectly reduce hatchability.

II. Experiments were planned to test the possibility of virus being present on the outer surface of the egg shell, using eggs laid by a flock during an active outbreak of the disease and also eggs from a flock harbouring carriers. In no case was it possible to demonstrate the presence of the virus on the egg shell.

Egg shells were artificially contaminated with virus and subsequently stored at 25°C. for 12 hours, and at 38°C. for five hours. Washings from these eggs inoculated intratracheally produced the disease in susceptible birds. When the period of storage at 25°C. or 38°C. was increased, the washings failed to produce the disease.

Filtration experiments showed that the aetiological agent of infectious laryngotracheitis may pass through Berkefeld V and N filters when a proper suspending vehicle is used. Broth and yeast extract were found to be far superior to distilled water or saline for this purpose. A loss of potency of virus suspensions of from ten to 100 times was demonstrated as a result of V and N Berkefeld filtration. The addition of testicular extract to infectious laryngotracheitis virus does not bring about infection when administered intravenously in guinea fowl, ducks, pigeons, white rats or guinea pigs.

Serial passage of the virus through baby chickens does not decrease its virulence for mature birds.

III. The authors have confirmed the work of Beaudette and Hudson that the tissues of the cloaca and bursa of Fabricus of chickens are susceptible to the virus of laryngotracheitis, and that the infection of these tissues causes a chicken to become refractory to tracheal infection with the virus.

Experiments have been carried out on vaccination by injection of virus suspension direct into the bursa of Fabricus with a hypodermic syringe, compared with the usual application of the virus to the cloacal mucous membrane with a brush or swab. The general character of the reaction in the tissues is essentially the same in both methods. The intrabursal injection of virus does not cause any systemic or general reaction.

It was found that Leghorn pullets should be vaccinated by intrabursal inoculation when two to four and a half months old, and Leghorn cockerels when two to three and a half months old. At these ages the inoculation into the bursa does not present any difficulties.

The fowls should be examined on the fifth day following vaccination in order to detect the reaction. One month after cloacal vaccination had been carried out in a flock, 125 unvaccinated chickens were added, and were allowed to remain for ten months in contact. No cases of laryngotracheitis occurred in the birds, and it is therefore regarded as evidence that cloacal vaccination does not cause fowls to become carriers of the virus.—Norman Dobson.

I. Hoge, V. M., & Cumming, H. S. (1934). Sur la psittacose aux États-Unis. [**Psittacosis in the United States**].—*Bull. off. int. Hyg. publ.* **26.** 1237-1251. [3 refs.]

II. Reiter. (1934). Les cas récents de psittacose en Allemagne. Examen de la situation actuelle. [**Psittacosis in Germany**].—*Ibid.* 1252-1253.

III. Morgan, M. T. (1934). Cas humains de psittacose observés en Angleterre et dans le pays de Galles depuis Mai 1932 et recherches récentes sur le diagnostic de la psittacose chez perroquets. [**Human Cases of Psittacosis**

in England and Wales. The Diagnosis of the Condition in Parrots].—*Ibid.* 1254-1255.

I. Since 1932, when 76 cases of psittacosis in human beings were reported in the United States, the number of outbreaks has materially diminished. This is ascribed very largely to the stringent regulations which have been enforced to control the traffic in susceptible birds between the different States.

A description is given of the clinical manifestations and *post-mortem* changes in four fatal cases. Diagnosis was readily established by the inoculation of mice with sputum and by the demonstration, at autopsy, of the elementary bodies (Levinthal-Coles-Lillie corpuscles) which are characteristic of the condition. The authors agree with Bedson [this *Bull.* **3.** 417.] that these bodies represent a phase in the life cycle of the virus, which possesses a virulent and an avirulent stage.

II. Several outbreaks of psittacosis were reported in Germany during 1932 to 1933. It is considered that they originated from birds which were apparently healthy, but were carriers of the virus. The introduction of rigorous methods of control is suggested.

III. Three cases (two definite and one suspected) of psittacosis have occurred since 1932. They were probably initiated by infected budgerigars obtained from the same dealer and imported contrary to the existing regulations.—R. E. Glover.

Ciuca, M., Balteanu, J., & Constantinesco, N. (1934). Contribution à l'étude éxperimentale du typhus exanthématique, maladie inapparente du Chat. [**Exanthematic Typhus in the Cat, Infection without Symptoms**].—*C. R. Soc. Biol. Paris.* **117.** 511-513. [1 ref.]

The authors record attempts to infect cats with exanthematic typhus by feeding them on infected guinea pigs. The cats failed to show any thermal reaction or to give a Weil-Felix reaction, but an emulsion of their brains, inoculated into guinea pigs, provoked a reaction and the animals were later shown to have become immune to the disease.—U. F. Richardson.

Sabin, A. B. (1934). **Studies on the B Virus. III. The Experimental Disease in *Macacus rhesus* Monkeys.**—*Brit. J. exp. Path.* **15.** 321-334. 2 tables. [6 refs.] [For abst. of previous articles of this series, see this *Bull.* **5.** 138].

The author has propagated the B virus in the monkey. Commencing with a brain suspension from the 16th passage in the rabbit, the virus was established by combined intraperitoneal or intracutaneous and intracerebral injection, and was transmitted in series through four generations of monkeys. Positive results were also obtained by the intravenous route, which induced exanthematous lesions on the skin, resembling generalized vaccinia. The B virus infection could be readily differentiated from the latter by the presence of acidophilic, intranuclear inclusions in the epithelial cells and the absence of Guarnieri-like bodies.

Of 13 sera from apparently normal monkeys, one only contained antibodies against the B virus.—R. E. Glover.

INVERTEBRATE VECTORS OF DISEASE.

Duke, H. L. (1933). **Studies on the Factors that may Influence the Transmission of Polymorphic Trypanosomes by Tsetse. VIII. The Effect of Cyclical Passage through Glossina.**—*Ann. trop. Med. Parasit.* **28.** 79-91. 1 table. [9 refs.] [For absts. of previous articles in this series see this *Bull.* **4.** 163, 425 and 509].

This article records experiments on the effect of cyclical passage through *Glossina* on the transmissibility of strains of *Tryp. brucei*, *T. gambiense* and *T. rhodesiense*. No material alteration occurred in the transmissibility index or in the power of infecting tsetse with a strain of *T. brucei*, which had been maintained by direct inoculation for five years, after a single cyclical passage through *G. morsitans*. Repeated cyclical passages of *T. brucei*, *T. gambiense* and *T. rhodesiense* through *G. palpalis* did not enhance the infectivity or transmissibility of any of the strains under experiment for this species of tsetse. Some strains showed a reduction of these powers. Some indication was obtained that individual hosts might diminish the power of a trypanosome to develop in tsetse, and a marked lowering of the transmissibility index occurred in several cases in which calves were employed as the trypanosome hosts. It is suggested that the stage of the trypanosome cycle in the mammalian host at which feeding of flies occurs may influence the power of the trypanosome to infect the tsetse.—U. F. RICHARDSON.

NASH, T. A. M. (1934). **The Efficacy of Bush Clearing as a Method of Tsetse Control.**—*W. Afr. med. J.* **7.** 137-139. [3 refs.]

The present paper is in the nature of a general discussion on the subject with suggestions for bush clearing against the different species of tsetse. Clearing may be either aggressive, when extermination of the fly is the aim, or defensive, when the object is to reduce contact of man with tsetse to negligible proportions by clearing the areas most frequented by man and tsetse.

Before clearing is attempted, the prevalent species of tsetse must be known, as the width of clearing necessary depends mainly on the species, and to a less extent on the local conditions.

Details are given of the technique suggested for clearing against *Glossina palpalis* and *G. tachinoides*, whilst clearing against *G. submorsitans* is discouraged as being unlikely to succeed.—J. S. STEWARD.

DE JESUS, Z. (1934). **The Repellent and Killing Effects of Gordura Grass on the Larvae of the Cattle Tick,** *Boöphilus australis*.—*Philipp. J. anim. Indust.* **1.** 193-205. 2 figs., 3 tables. [5 refs.] [A supplementary paper ; see also this *Bull.* **4.** 659].

Gordura grass, *Melinus minutiflora* Beauv., is a succulent cattle food with reputed insecticidal properties. The author records the results of his investigations on the repellent properties of the plant.

The smell of gordura grass apparently has a distinct repellent effect on the larvae of *B. australis*, but the smell alone did not deter their progress in climbing the grass. It was found that the glandular hairs of the plant exuded an oil which entangled the legs of the larval ticks and, it is suggested, covered their bodies, with the result that they died either from exhaustion due to struggling or asphyxiation by the sealing of their stigmata by the oil. Mosquitoes also were observed to become entangled in the hairs of the young leaves of the grass, but larger insects, such as Tabanidae and ants, were apparently unaffected by either the smell or the hairs of the plant.

It is suggested that gordura pastures may be used as a tick-free area in the rotation of animals at pasture in the course of dipping for the control of cattle ticks.—J. S. STEWARD.

KRULL, W. H. (1934). **The Intermediate Hosts of Fasciola hepatica and Fascioloides magna in the United States.**—*N. Amer. Vet.* **15.** No. 12. 13-16. 1 fig., 1 table. [12 refs.]

This paper summarizes what is known of the intermediate hosts of *F. hepatica* and *F. magna* in the United States. *Galba bulimoides*, *G. bulimoides techella*, *G. cubensis*, *G. ferruginea*, *Fossaria modicella*, *Pseudosuccinea columella* and *Lymnea traskii* serve as intermediate hosts for *F. hepatica*, and *G. bulimoides techella*, *F. modicella*, *F. modicella rustica* and *P. columella* for *F. magna*. *L. traskii* is a new intermediate host, the author's observations being reported here for the first time : apparently it can only be infected when immature.

An account is also given of the distribution of the snails in the United States, showing intermediate hosts to be present in every State.—E. L. Taylor.

DISEASES CAUSED BY METAZOAN PARASITES.

Nieschulz, O. (1934). Ueber die Vorzugstemperatur von Stomoxys calcitrans. [**The Temperature Preferred by** *Stomoxys calcitrans*].—*Z. angew. Ent.* **21.** 224-238. 2 figs. [7 refs.]

The temperature preferred by *S. calcitrans* under different experimental conditions has been ascertained. Flies were kept in an apparatus in which the temperature varied in different parts. The optimal temperature was taken as that of the part of the apparatus at which the majority of flies congregated 30 minutes or more after introduction. The greatest number of flies (the median) preferred a temperature of 29°C. The average preference (arithmetic mean) was for 27·9°C. There appeared to be no striking difference between the preference of males and females. The outside temperature possibly had some slight influence upon results, whilst feeding had none. Alteration of humidity within the apparatus did not influence the results. Storage of flies in the refrigerator or incubation at 28°C. for three to five days had no lasting effect upon the temperature for which they showed a preference.—E. J. Pullinger.

Thomsen, M. (1934). **Fly Control in Denmark.**—*Quart. Bull. Hlth Org. L. o. N.* **3.** 304-324. 2 figs., 13 plates. [4 refs.]

Thomsen gives a brief description of the most common species of muscid flies with excellent coloured illustrations of eggs, larvae and adults.

Investigation of the breeding places of *Musca* and *Stomoxys* in Denmark shows that the house-fly breeds in the faeces of swine, horses and calves in that order of preference, and the stable-fly in calf and horse faeces and, to a less extent, in cow dung mixed with moist straw.

Measures of control are directed against the larvae rather than the adults, and the use of chemicals is considered impracticable except where expense is of no importance. The author considers that the use of hot water between 70° and 90°C. is of value if intelligently applied, but that the most hopeful method of attack is a modification of Roubaud's biothermic method. This method depends upon the temperature of fermenting manure rising to 70°C. or more, the fresh manure being buried daily in the warmer inner layers of the manure heap. This method can be successfully applied to pure horse manure, but not to heaps of pig or cow dung. Covering manure heaps with tarpaulins made of discarded nitrate sacks proved a useful modification of the method as, in addition to the destruction of the larvae and pupae, the adult flies were prevented from ovipositing. Flies cannot be exterminated, but can be considerably reduced by conscientious cleaning out of all animal sheds and covering of manure heaps during the summer.

—J. S. Steward

DILL, R. (1934). **Grub in the Head in Sheep in North-Eastern Nevada : Methods of Herding which Favored Injury and Methods of Range Management which Practically Eliminate Losses.**—*Bull. Nev. agric. Exp. Sta.* No. 135. pp. 12. 4 figs. [Copied *verbatim* from *Exp. Sta. Rec.* **71.** 388].

The author reports that severe losses of sheep were recorded from several herds on ranges in north-eastern White Pine County, Nevada, late in the winter and early in the spring of 1933. From 200 to 250 head were lost from many of the herds ; deaths were then occurring on several ranges in the same general region ; and reports were received of similar losses taking place in an adjacent region in Utah.

The account deals briefly with the symptoms, local injuries, origin of the grub in the head, the problem of preventing the fly from laying its eggs, killing or removal of the maggots in the head, etc.

EWING, H. E. (1934). **The Identity and Proper Scientific Name for the Sucking Louse of North American Domesticated Pigs.**—*Proc. helminth. Soc. Wash.* **1.** 65-66. [Abst. from abst. in *Rev. appl. Ent.* **22.** 206-207].

The louse that occurs in Europe on the wild boar is specifically distinct from the louse of Asiatic wild pigs and domesticated breeds derived from them. *Haematopinus suis* L. is the name that should be used for the former, and *H. adventicius* Neum. for the latter. *H. suis chinesis* Fahrenh. and *H. suis germanicus* Fahrenh. are considered to be sub-species of *H. adventicius*. The louse commonly found on domesticated swine in the United States of America is stated to be *H. adventicius chinesis*.—J. S. STEWARD.

RUITER, M. (1934). Een geval van zoogenaamde duivenschurft. **[Case of So-called Pigeon Scabies].**—*Ned. Tijdschr. Geneesk.* **78.** 3571-3574. 1 plate. [English summary] [Copied *verbatim* from *Bull. Hyg., Lond.* **9.** 757].

" A case of gamasidiosis is described as pigeon-scabies in a human subject, in which the parasite (*Dermanyssus avium*) was found in the clothes, bedclothes and sleeping room (attic) of the patient. The source of infection was found to be a few wild pigeons, which had nested for a long time on the roof."

ROBERTS, F. H. S. (1934). **Worm Parasites of Domesticated Animals in Queensland.**—*Pamphl. Dep. Agric. & Stock. Queensland.* No. 2. pp. 8. [21 refs.]

The author gives a check list of worm parasites so far collected from domestic animals in Queensland. Short notes in regard to incidence, pathogenic and economic significance, etc. are appended.—H. McL. GORDON.

OLDHAM, J. N., & MORGAN, D. O. (1934). **Helminth Parasites Observed in a Herd of Goats Maintained at St. Albans, England.**—*J. Helminth.* **12.** 39-46. [7 refs.]

The scarcity of available information on the helminth parasites of goats has encouraged the authors to make a record of the parasites found in 80 goats on which *post-mortem* examinations have been carried out at the Institute farm. Fourteen of the goats appeared to be entirely free from parasitic worms ; 19 different species of helminths were recovered from the 66 infested goats, two cestode and 17 nematode forms. Among the nematode parasites, *Trichostrongylus capricola* was found in 13 animals and *Skrjabinema ovis* in three animals. These are the two most unusual finds. The most prevalent species was *Trichuris ovis*, after which followed closely *Chabertia ovina* and *Ostertagia circumcincta*, these three species

occurring in more than 50 per cent. of the goats, Next in order of frequency, and occurring in more than 33 per cent. of the goats, were the species *Oesophagostomum venulosum*, *Trichostrongylus vitrinus* and *Haemonchus contortus*, the other species being found in less than 25 per cent. of the animals.—E. L. Taylor.

Soler, R. R. (1934). Contribución al estudio de la parasitologia intestinal del cerdo de la región valenciana. [**Contribution to the Study of Intestinal Parasitism in the Pig in the Valencia District**].—*Rev. Hig. Sanid. pecuar.* **24.** 343-361. 6 figs. [15 refs.]

The greater part of this paper is a discussion of parasitological technique. An examination was made of samples of faeces from 200 pigs, selected at random. The following rate of infection was observed :– coccidia, 43·5 per cent. ; oesophagostomum, 21 per cent. ; ascaris, 17·5 per cent. ; trichocephalus 16 per cent., and strongyloides, 9 per cent.—R. S. Roberts.

Wiese, E. (1934). Distomatose hos storfe i Vestfold. [**Fascioliasis in Cattle in Vestfold (Norway)**].—*Norsk. VetTidsskr.* **46.** 489-502. 4 tables, 1 map. [2 refs.]

As meat inspector at the municipal abattoir at Horten, the author made a record of the number of cattle whose livers were affected with fascioliasis in the years 1926 to 1933. The percentage ranges from 5 to 8·4 annually. During recent years the small fluke, *Distomum lanceolatum*, seems to have occurred quite as frequently as *Fasciola hepatica*. A calculation of the annual losses in the district is given, and the importance to the practitioner of the infestation is mentioned. The author gives a record of the age of the animals affected and discusses the diagnosis and pathology. Finally, the suggestion is made that there will be no effective control of the parasite until the government insists that this infestation be included in the list of scheduled diseases.—Gustav Naerland (Farsund).

Okland, F. (1934). Utbredelse og hyppighet av den store leverikte (Fasciola hepatica L.) i Norge. [**Incidence of Fascioliasis in Norway**].—*Norsk VetTidsskr.* **46.** 317-330, 387-408 and 464-479. 1 fig., 1 map. [5 refs.] [German summary : abst. from orig.]

In this article, the author publishes the first results of his investigation to determine the distribution and frequency of *Fasciola hepatica* in Norway. He sent inquiries to all veterinarians in the country, asking them :– (1) if the fluke occurs in their districts ; (2) if possible, to give an account as to the frequency of its occurrence ; (3) if the incidence varies in different years.

From the information so obtained, Okland has shown the incidence of the fluke on a map, from which it will be seen that the distribution is very uneven. It is found all along the south and west coasts and as far north as 70°. It is, however, strange that fascioliasis is practically unknown near sea level in the deep fjords on the west coast. Inland, in the eastern districts of the country, it is seldom found far up in the long valleys and, where it does appear, it is confined to low-lying, flooded places on the banks of streams and lakes. It is still unknown in the central mountainous parts of the country.

Some theoretical considerations as to this varying distribution and the reason for it are given. Amongst other points, the author wonders why it is absent in Finmarken, although the snail, *Limnea truncatula*, is quite common. This investigation is said to be a preliminary one, and papers containing more exact statistical contributions will be published later.—Gustav Naerland (Farsund).

Szepeshelyi, A., & Urbányi, L. (1934). Anreicherungsmethode zum Nachweis der Distomeneier. [**The Concentration of *Fasciola* Eggs**].—*Münch. tierärztl. Wschr.* **85.** 293-295. 1 fig.

The authors describe a method for the concentration of the eggs of *Fasciola hepatica* by floatation in a solution of potassium mercury iodide. A series of trials showed that a specific gravity of between 1·4 and 1·45 gave the best results and that the solution could be prepared by adding 10 g. of mercuric iodide and 7·4 g. of potassium iodide to 26·5 c.c. of water. Although the relative density of this solution is so great, its viscosity is much lower than that of glycerin or water-glass, both of which have been used for this purpose, and it gives very satisfactory results, its high cost being the only serious drawback. [This method has been tried and found to be a most satisfactory way of concentrating the eggs of *Fasciola*].
—E. L. Taylor.

Stewart, W. L. (1934). **A Note on the Development of Fasciola hepatica and an Outbreak of Acute Liver Rot.**—*Vet. J.* **90.** 403-405. [4 refs.]

An outbreak of acute disease among a flock of 100 sheep was found to be due to extensive infestation with liver flukes. Eight sheep had died before the outbreak was investigated, and anthrax had been suspected. The carcass of one sheep, on which a *post-mortem* examination was carried out, was distended with gas, while blood was oozing from the anus ; a most striking feature was discolouration and turgidity of the whole of the small intestine, which was full of liquid ingesta and blood in a semi-clotted state. The haemorrhage proved to originate in the liver, whence it had come *via* the bile duct, the migration of the young flukes doubtless causing the rupture of blood vessels and the draining away of the blood through the bile canaliculi. The capsule of the liver was studded with dark areas, of about 3 mm. in diameter, where the young flukes had made their entry, and a number of immature flukes about one-quarter of an inch long were detected in the liver substance. [Haemorrhage is not a constant feature of this rather rare form of fascioliasis, but the liver is usually enlarged and a considerable amount of fluid may be found in the abdominal cavity. Flukes may not be very easy to find, but are best demonstrated by placing pieces of the liver in water and squeezing them with the idea of forcing the flukes out into the water].—E. L. Taylor.

de Waele, A. (1934). Nieuwe bevindingen over der levenscyclus der Cestoden. [**New Observations concerning the Life Cycle of Cestodes**].—*Natuurwet. Tijdschr.* **16.** 60-69. [4 refs.]

The immunity of cestodes to digestive fluids is due to the resistance of the cuticle which becomes permeable by successive treatment with an acid and alkaline medium. Since the tapeworms are situated in the intestines, the onchospheres cannot be liberated while they are within the body of the original host, but must pass through an intermediate host. The evagination of the neck and scolex also depends upon the pH.

The destruction of the onchospheres in species unsuitable as hosts is brought about by the blood.

There is a similar influence of ferments on the onchospheres in all species of the same class. Whether a particular species of animal can act as a host of the parasite or not can be determined by testing the effect of its digestive juices on onchospheres.—J. van der Hoeden (Utrecht).

I. Skriabine, K. J., & Schulz, R. S. (1934). La lutte contre les moniézioses. Invasions des moutons par les vers rubanés. [**The Control of Moniezia in Sheep**].—*Bull. Off. internat. Epiz.* **8.** 354-378.

II. Stunkard, H. W. (1934). **Studies on the Life History of Anoplocephaline Cestodes.**—*Z. Parasitenk.* **6.** 481-507. [50 refs.] [Orig. in English].

I. Moniezia is regarded as extremely harmful to sheep, particularly lambs, in many parts of the world and, according to the authors, is frequently responsible for a mortality of 80 per cent. of the lambs in certain localities in Russia. Although we know nothing of the life history of the worms of this genus, it is clear that the lambs acquire the infection from the pastures ; treatment should therefore be applied before the worms become mature and eggs and gravid segments are disseminated by infected sheep. Several treatments were tried, but a 1·125 per cent. solution of copper sulphate, in doses varying according to the size and age of the sheep, was found to be of the greatest general value ; a single dose removes about 80 per cent. of the worms, and a second dose given ten days or a fortnight later was found to remove all the worms from 98 per cent. of the sheep. The anthelmintic dose should be followed by a purgative dose of sodium sulphate.

II. The 114 species of the Anoplocephalidae listed by Baer are from a wide variety of hosts ; 84 are from mammals, 17 from birds and 13 from reptiles which, doubtless, has a bearing on the origin, evolution and dispersal of this family of tapeworms. As there is apparently no common feeding habit among the multitude of species that serve as final hosts, it must be supposed that the larvae are not present in the essential food material of the definitive host, but are accidentally ingested. The author gives a full historical review of recorded attempts to elucidate the life history, and follows this with an account of a few observations which he has made himself on the occurrence of *Andrya* and *Cittotaenia* in hares and rabbits, mostly throughout the winter months. Only a few rabbits were available during the spring and summer, but the examinations made during the other seasons showed that infestations are heaviest in the autumn and early winter, after which they decrease until fresh infestation appears in the late spring. An account is also given of the structure of the eggs of these species and the behaviour of the six-hooked embryo when liberated from the pyriform apparatus. The several theories for the life cycle of the anoplocephaline worms are discussed separately ; they fall into two groups, those postulating a direct life history and those requiring the intervention of an intermediate host. In the first group are the following three theories :– (1) the development of onchospheres in the intestinal wall of the primary host, the larvae returning later to the lumen ; (2) the development of onchospheres in other organs of the primary host, for example the mammary gland, and (3) the development of larvae in the intestine after a period of maturation outside the body of the primary host, possibly brought about by passage through the intestine of some other animal. In the second group there are two postulates :– (1) the development of the larva in an intermediate host which is ingested by the definitive host, and (2) the development of onchospheres in a secondary host followed by a later free stage, probably encysted. The discussion of these postulates leads the author to the conclusion that an intermediate host is requisite and that its character can be outlined with considerable assurance. It must be a terrestrial invertebrate which, in either larval or adult stages, frequents the faecal material of animals which harbour the adult cestode ; but the intermediate host in all probability does not feed on the faeces as it would become too heavily infested and ingestion of onchospheres is almost certainly accidental. It must be very abundant and small (as it can be ingested by a two to three weeks old rabbit).

The family to which the intermediate hosts belong must be a large one and of world-wide distribution and its members be more or less regularly eaten by monkeys, cattle, horses, rhinoceros, rodents and many kinds of herbivorous mammals ; also by birds and reptiles.—E. L. Taylor.

DE WAELE, A. (1934). Etude de la fonction biliaire dans le phénomène de l'évagination chez les cysticerques des cestodes. [**The Function of Bile on the Evagination of Cysticerci**].—*Ann. Parasit. hum. comp.* **12.** 492-510. 1 fig., 8 tables. [6 refs.]

de Waele has tried all the various substances found in bile and has shown that none, except the bile salts, have any action on the evagination of *Cysticercus pisiformis*. Evagination does take place in an irregular way in physiological saline or in Ringer's solution at 37°C. and at a pH above 6·0, but 20 seconds in bile salts is sufficient to activate the muscles and bring about the change.

Sodium glycocholate was found to be toxic to *C. pisiformis*, six to eight hours' immersion in a 2 to 5 per cent. solution resulting in the death of the cyst. In this, de Waele sees a possible explanation for the highly specific host requirements of cestodes. Sodium glycocholate is not found in the bile of the dog, and it is possibly this salt which eliminates the cestode from the intestine of unsuitable hosts. The author considers it possible that the small differences in the proportions of glycocholate and taurocholate may be the deciding factor in the suitability of the host to its cestode parasites.—E. L. TAYLOR.

ACKERT, J. E., & WILMOTH, J. H. (1934). **Resistant and Susceptible Strains of White Minorca Chickens to the Nematode,** *Ascaridia lineata* **(Schneider).** —*J. Parasit.* **20.** 323-324.

A comparison made between two flocks of chickens as to their resistance to *A. lineata* showed that a White Minorca flock was more resistant than a White Leghorn flock ; the worms from the Minorcas averaged 19·03 mm. and those from the Leghorns 23·83 mm. – a difference 9·72 times the probable error. When the observations were repeated in the following year, however, the results were reversed. The only obvious difference from the previous year was that new cockerels had been introduced into the Minorca flock. The Minorca chickens in the second year were much lighter than in the first and it is suggested that the new strain introduced by the cockerels was much less resistant to the worms.

—E. L. TAYLOR.

CALZADA, V. (1934). Cinq espèces de la famille des *Strongylidae* observées chez les animaux domestiques de l'Uruguay. [**Five Species of Strongylidae observed in Domestic Animals in Uruguay**].—*C. R. Soc. Biol. Paris.* **117.** 549-550.

Calzada records the finding of *Metastrongylus apri*, *M. brevivaginatus*, *Nematodirus spathiger*, *N. filicollis* and *Trichostrongylus vitrinus* in Uruguay. Morphological characters are mentioned by which the females of the two species of *Metastrongylus* may be distinguished : *M. brevivaginatus* has a rectiliniar caudal extremity and *M. apri* a curved one ; *M. brevivaginatus* also carries a small pedicular membraneous structure at its caudal extremity. A method is described of searching for the small trichostrongyles in the small intestine of sheep. [The two species of *Metastrongylus* are mentioned, in error, as having been found in the alimentary canal].—E. L. TAYLOR.

BELL, F. N. (1934). **A Microfilaria in the Blood of Cattle.**—*J. Amer. vet. med. Ass.* **85.** 747-759. 2 figs., 5 tables. [25 refs.]

This investigation into the incidence of microfilariae in the blood of cattle in Wisconsin was suggested by the chance finding of one while making a leucocyte count. Microfilariae had not previously been reported in cattle in Wisconsin, but an examination of 158 animals belonging to three different herds showed an

incidence of 11·11 per cent., 9·99 per cent. and 5·94 per cent. respectively. The numbers of microfilariae per c.c. were found to range up to 194. Examinations of blood from the same cattle at intervals of two months showed a variation within fairly wide limits, but no evidence could be found of any regular daily periodicity in their appearance in the peripheral blood. These microfilariae are probably the larval stage of *Setaria labiato-papillosa*.—E. L. Taylor.

Morel, R. (1934). Contribution à l'étude des habronémoses. [**Habronemiasis**]. —*Thesis for Docteur vétérinaire, Alfort.* pp. 67. [83 refs.]

Morel describes the morphology of the adult *Habronema megastomum*, *H. muscae* and *H. microstomum*, and also that of their respective larvae. In their life cycles, the first two species pass through *Musca domestica*, and the third through *Stomoxys calcitrans*. The lesions of gastric, cutaneous and pulmonary habronemiasis are described. The best method for the diagnosis of the gastric form is by infecting recently hatched fly larvae, i.e., biological or xenodiagnosis [see this *Bull.* **5.** 143]. This is only possible, however, during the hot weather (June to September).

It is difficult to find the worms in the summer sores, but there is a marked eosinophilia at the periphery of the wounds. The control of the worms is dependent on the control of the two intermediate hosts. The details of the anthelmintic treatment recommended are vague. Anti-fly measures are fully described. " Novarsenobenzol " in glycerin, as an ointment or in powdered form, is said to give excellent results as a treatment for summer sores, a cure usually resulting in a fortnight.—A. W. N. Pillers.

McCoy, O. R. (1934). **The Development of Adult Trichinae in Chick and Rat Embryos.**—*J. Parasit.* **20.** 333.

Development of *Trichinella spiralis* up to sexual maturity was obtained by injecting the larvae (obtained from rat muscle and sterilized in merthiolate) into the amniotic sac of chick and rat embryos. One female worm recovered from a chick, and several recovered from rats at the fifth day, were found with young larvae developing in the uteri. Attempts made to obtain development of the larvae in sterile amniotic fluid, incubated *in vitro*, were, however, unsuccessful.

—E. L. Taylor.

Frant, S. (1934). **Five Years' Experience with Trichinosis in New York City.**—*Publ. Hlth Rep., Wash.* **49.** 869-875. 7 tables. [10 refs.]

This paper gives a brief review of trichinosis with reference to public health in New York City, where the disease is a constant problem and has been steadily increasing in prevalence. Fifty cases were reported for the first three months of 1934; this exceeds the entire yearly total for any year since 1920. On several occasions the source of infection has been traced to inspected food and it is clear that the meat inspection methods of the United States Department of Agriculture are not sufficient safeguard, and that the adequate cooking of pork and pork products is most important. Epidemiological data are presented on 166 cases of trichinosis reported to the New York Department of Health for the years 1929 to 1933.—E. L. Taylor.

IMMUNITY.

Laporte, R. (1934). Histo-cytologie des réactions locales d'hypersensibilité chez le cobaye (réactions allergiques à la tuberculine et réactions anaphylactiques).

[The Histology of Local (Tuberculin) Allergic and Anaphylactic Reactions in the Guinea Pig].—*Ann. Inst. Pasteur.* **53.** 598-640. 13 figs. [45 refs.]

The author has compared the histological appearances of the allergic reaction to tuberculin in sensitized guinea pigs (BCG) with the anaphylactic reaction induced by egg-white, etc. He differentiates the former on the grounds of the slowness of development and extension of the inflammatory reaction, which is mainly monocytic in nature. This type of cell predominates from the sixth hour and is particularly abundant in the perivascular infiltrations in the subcutaneous tissue. Necrosis and invasion of the lesion by polynuclears usually follow. The reaction, which reaches its maximum intensity at the 30th hour, is succeeded by the formation of a histiocytic granulation tissue with giant cells.

In local anaphylaxis, on the other hand, the phenomena are much more rapid and severe, with block necrosis and intense haemorrhage. There is an abundant oedematous exudation, and a predominance of leucocytes and eosinophiles. Nevertheless, the terminal changes may resemble those of allergy.

In normal guinea pigs, both glycerin broth and tuberculin induce a slight oedematous reaction, with a polynuclear infiltration which rapidly fades. In the allergic animal, on the other hand, in addition to the positive reaction to tuberculin, glycerin broth may produce a picture which is indistinguishable from the specific tuberculin reaction, except in the degree of its intensity.—R. E. Glover.

Reed, G. B., Rice, Christine E., & Gardiner, B. G. (1934). **Rate of Response of Rabbits to Two Antigens of Tubercle Bacilli.**—*J. Immunol.* **27.** 487-513. 6 figs., 8 tables. [15 refs.]

Recent experimental work has shown that colony variations in the acid-fast group of bacteria are accompanied by variation in antigenic content. Quantitative complement-fixation tests on rabbits, immunized with heat-killed S and R types of tubercle bacilli and other acid-fast types, demonstrate this point. This report is designed to determine the rate of response to repeated injections of both antigens in rabbits, the original procedure being closely followed.

So far as antibody response can be measured by complement-fixation tests, it was demonstrated, in the course of experiments, that the response to initial doses was the same in both the heat-killed S and R types of organism. After the fourth to sixth dose, a striking difference became apparent. S-specific antibodies appeared more slowly than the group or species R type, and disappeared more rapidly when antigenic stimulation ceases.

The conclusion is drawn that both the S and R types of tubercle bacillus contain a species or group antigen to which rabbits are relatively responsive. The S type contains, in addition, an S-specific antigen to which rabbits are responsive only after prolonged immunization.—A. L. Mullen.

Smithburn, K. C., Sabin, F. R., & Geiger, J. T. (1934). **The Effects of Tuberculo-Protein (MA 100) on the Course of Experimental Tuberculosis in Rabbits and Guinea Pigs.**—*Amer. Rev. Tuberc.* **29.** 562-570. 2 tables, 2 charts. [18 refs.]

Tuberculo-protein (MA-100) was obtained by growing cultures of tubercle bacilli on protein-free media, fractionating out the various constituents and testing their effect on healthy and tuberculous animals.

Eight rabbits and nine guinea pigs were inoculated daily with increasing doses of tuberculo-protein for 13 weeks, after which period they were inoculated with virulent tubercle bacilli; 30 rabbits and ten guinea pigs, as controls, were inoculated at the same time. The inoculations of tuberculo-protein were then

continued for a further period of three weeks in the treated animals. The last dose of protein before inoculation with the tubercle bacilli was given intracutaneously to test for hypersensitiveness. Positive results were obtained. The guinea pigs did not give a thermal response to the daily inoculations made before inoculation of the virulent bacilli.

The treated animals did not show a greater longevity than the controls. The macroscopic and microscopic characters were similar in both groups. Thus skin sensitiveness to tuberculo-protein (MA-100) was produced without the acquisition of immunity to tubercle bacilli.—A. Brownlee.

Sewall, H., de Savitsch, E., & Butler, C. P. (1934). **The Time-Interval between Primary Infection and Superinfection as a Factor in Immunity to Tuberculosis. An Experimental Study.**—*Amer. Rev. Tuberc.* **29.** 373-388. [14 refs.]

Two experiments were carried out. In the first, 24 guinea pigs were inoculated with 0·1 mg. of virulent culture and, of these, six received a superinfecting dose on the opposite side 53 days, and six a dose 74 days after the first inoculation. In the second experiment, 36 guinea pigs were inoculated and, of these, six were superinfected 53 days, six, 74 days, and six, 95 days after the first inoculation.

The results showed that the local response (allergy) was greater when the guinea pigs were superinfected early (53 days) than when superinfected later (74 and 95 days), and the immunity response was greater in those superinfected late than in those superinfected early. This greater immunity was manifested by the regular clearing up of the local subcutaneous abscess which follows at the site of superinfection. In addition, in the later superinfected animals, the superinfection appeared to stimulate the host tissues to fibrose and segregate existing foci, but early superinfection appeared to be harmful to the host.—A. Brownlee.

Jezic, J. (1934). Ueber die Möglichkeit der gleichzeitigen Pocken- und Milzbrandimpfung bei Schafen. [**Possibility of Simultaneous Inoculation against Sheep Pox and Anthrax in Sheep**].—*Tierärztl. Rdsch.* **40.** 533-535. 1 table.

In view of the reported antagonism between the sheep pox virus and *Bacillus anthracis*, experiments were carried out to ascertain whether sheep could be immunized to both diseases by simultaneous inoculation. It was found that a pathogenic strain of *B. anthracis* grew freely in broth to which 50 per cent. of sheep pox lymph was added, and that the organism would grow weakly in pure lymph.

For *in vivo* experiments an antiserum-lymph mixture was used for the pox immunization, and a single anthrax vaccination by the Pasteur method or the glucoside-vaccine of Mazzuchi and Hruska was given. Previous immunity to one disease did not prevent immunization against the other. Simultaneous immunization was successful if the vaccines were inoculated separately but, when anthrax vaccine was suspended in sheep pox lymph and inoculated intradermally, immunity to sheep pox was obtained, but no immunity to anthrax could be detected.

—U. F. Richardson.

Lissot. (1934). La vaccination par voie buccale en pathologie aviaire. [**Peroral Vaccination against Fowl Diseases**].—*Rev. Path. comp.* **34.** 1643-1654. [24 refs.]

Peroral vaccination appears to have many advantages in the control of certain fowl diseases. Administration is simple, a more concentrated vaccine can be employed than by subcutaneous inoculation, it can be used for immunizing day-old chicks and it causes little or no generalized reaction.

Peroral vaccination was very successful in two flocks of chickens in which outbreaks of *Salmonella* (formerly *Bact.*) *pullorum* infection had occurred. In the first flock 2,500 chicks were vaccinated *per os* and 140 kept as controls. In the group of 2,500, mortality was 120 (6 per cent.) while in the 140 controls, mortality was 68 (47 per cent.). In the second flock, 500 chicks were vaccinated *per os* and 80 kept as controls. There was a mortality of 42 (8 per cent.) in the group of 500 vaccinated chicks, and a mortality of 57 (70 per cent.) in the group of controls.

The author has also successfully used a trivalent vaccine against fowl cholera, fowl typhoid and *S. pullorum* infection. This is a killed vaccine, dried and mixed with the food. In all, six immunizing meals are given at intervals of three days. Groups of fowls on three infected farms were vaccinated perorally with the trivalent vaccine and neither in that year, nor during the following year (after revaccination), was there any case of fowl cholera, fowl typhoid or *S. pullorum* infection. Since then, 24 flocks have been successfully vaccinated by this method, one against fowl cholera, two against fowl typhoid and 21 against *S. pullorum* infection.—R. F. Gordon.

Brown, H. C., & Broom, J. C. (1935). **The Importance of Electric Charge in Certain Aspects of Immunity.**—*Trans. R. Soc. trop. Med. Hyg.* **28.** 357-371. 9 figs., 7 tables. [9 refs.]

This paper is the report of a semi-popular lecture in which the authors give a summary of much of their work which has already been published in the *Brit. J. exp. Path.* It is said that electric charge plays an important part in virulence of bacteria, agglutination, phagocytosis, haemolysis and many other similar conditions. It is shown how the electric charge of bodies can be adjusted by the addition of suitable quantities of appropriate salts, for example, sodium chloride, thorium nitrate and potassium ferrocyanide, and how all negatively charged particles become more strongly attracted in the presence of immune serum while positive particles will show no such increased attraction. The enhanced action of certain drugs in bacterial infection in the presence of immune serum may be explained in this manner. In the course of phagocytosis both of bacteria and of red blood corpuscles, the reduction of the electric charge of these elements is a necessary preliminary to ingestion, and the authors show how limitation of this reduction in charge diminishes the degree of phagocytosis. Serum haemolysis, which is also preceded by charge reduction of the red cells, can be controlled both *in vitro* and *in vivo* by applying the same principles ; this explains the action of electrolytes in promoting, and the action of sodium citrate in inhibiting, haemolysis. Coming to more debatable ground, the authors suggest that the electric state of the reagents taking part in such widely different conditions as non-specific protein shock therapy, and the adhesion test for leptospirosis and trypanosomiasis is an important factor in these reactions. A significant finding by the authors was that euglobulin had a much greater effect in reducing the electric charge of washed bacteria than either albumin or pseudoglobulin. Thus later work may determine the part played by increase of antibody content in aiding phagocytosis.—James Stewart.

Rüscher. (1934). Die Blutgruppenbestimmung beim Pferde. [**Determination of Blood Groups in the Horse**].—*Z. Veterinärk.* **46.** 388-397. 6 tables. [8 refs.]

Using a modified technique, a description of which is given, the author examined the blood of 93 horses of various breeds with a view to ascertaining the number and relative frequency of blood groups in this animal.

He was able to demonstrate the existence of five different groups described

as A, B, ABO, O and AB. Of the 93 animals, 25·8 per cent. belonged to group A, 22·5 per cent. to B, 40·8 per cent. to ABO, 7·5 per cent. to O and 3·2 per cent. to AB. There was insufficient evidence to show that a particular blood group was transmitted from parent to offspring, although a high percentage of the thoroughbreds were of the ABO group whilst those of very mixed pedigree were either of the A or B group.—N. S. Barron.

Pijper, A. (1934). **Blood-Group and Red-Cell Diameter.**—*S. Afr. med. J.* **8.** 703-704. 6 charts. [11 refs.]

An attempt was made to correlate the blood group and the red cell diameter in the human being. Irregularities in the red cell diameters of different members of a community suggest that they may be related to variations in blood groups. As a result of his own experiments, the author considers that he has produced evidence in favour of a relationship between the blood group and red cell diameter. —E. M. Robinson.

DISEASES, GENERAL.

Stubbs, E. L., Beach, J. R., Brandly, C. A., Stafseth, H. J., & van Roekel, H. (1934). **Report of the Special Committee on Poultry Diseases [Amer. Vet. Med. Ass.]**—*J. Amer. vet. med. Ass.* **85.** 517-518.

The committee urges veterinary colleges to increase their courses and research work on poultry diseases and to conduct post-graduate classes for practitioners. Attention is drawn to the great danger of spreading disease by the use of the cloacal method of vaccination with living virus against infectious laryngotracheitis. The slow tube test continues to be the best method of detecting *Salmonella* (formerly *Bact.*) *pullorum* infection and, until more reliable data are presented, the rapid whole blood test must be regarded as experimental. It is recommended that the control and eradication of infectious and communicable diseases of poultry be assigned to authorities in charge of infectious diseases of other domestic animals. —R. F. Gordon.

Smith, J. M., & Gilbert, S. J. (1934). **Cattle Diseases Occurring in Palestine and Segregation and Prevention Control of Bovine Contagious Abortion.**—*J. comp. Path.* **47.** 94-106. 5 tables.

An interesting survey of the agricultural and veterinary aspects of Palestine is given. A recent outbreak of rinderpest was eliminated by slaughter and passive immunization methods, the cost of this campaign being £12,000. A mild type of foot and mouth disease is encountered throughout the country and no serious attempt is made to check it. Anthrax, theileriasis, anaplasmosis and piroplasmosis are all enzootic diseases. Mastitis, tuberculosis and blackleg all occur, but not extensively. There follows an account of a campaign against bovine contagious abortion, which constitutes one of the most serious menaces to stock farming. Control measures are specially adapted to the local requirements, and readers who are interested are referred to the original article.—E. J. Pullinger.

Marshall, D. (1934). **Pig Management and its Relation to Disease.**—*N. Z. J. Agric.* **48.** 352-356.

On account of an increasing mortality in pigs between weaner and porker age, an instructive article has been written by this author as a warning to farmers who are breeding pigs.

The article deals with factors affecting vitality, such as overcrowding, dirt, draughts and feeding. A description of food values is given, particular stress being laid on minerals and vitamins A and D. As, in New Zealand, pigs are largely fed on skim milk with very little other food, the necessity is stressed for the addition of vitamin A and some form of carbohydrate to this ration as a protection against disease.—C. S. M. Hopkirk.

Howarth, J. A. (1934). **Diseases of Sheep.**—*Circ. Calif. agric. Ext. Serv.* No. 86. pp. 71. 49 figs. [16 refs.]

This circular gives a short account of the diseases of sheep, excluding those due to arthropod and helminth parasites and those due to plant poisons. In the introduction, the author draws attention to the increase in sheep diseases in the United States of America associated with the decrease in the areas of open ranges, with the consequent congestion of stock. Most of the information supplied is already described in veterinary text-books. Dealing with abortion in ewes, three types are described :– (1) vibrionic abortion ; (2) a type of bacterial abortion associated with *Bact.* (formerly *Escherichia*) *coli* and a type of salmonella ; in this type most of the lambs are born dead, and a high mortality occurs among the ewes, and (3) nutritional abortion, resulting from a lack of sufficient digestible carbohydrates, proteins, fats, minerals and vitamins for the production of healthy lambs. In the circumstances in which this condition occurs, the available foodstuff is dry grass or straw of little food value.

A form of lamb dysentery affects lambs one to six days old in the acute type, and lambs up to three weeks old in the chronic type. Inflammation of the intestines is found, but ulceration of the intestine is not described. Also the " lamb dysentery bacillus " was not found, so that the disease appears different from the lamb dysentery found in Great Britain.—A. Brownlee.

Stoss, A. O. (1934). Die Bekämpfung der Unfruchtbarkeit bei den grossen Haustieren. [**Control of Sterility in Large Animals**].—*Münch. tierärztl. Wschr.* **85.** 545-550 and 557-561. [38 refs.]

A review of the aetiology, diagnosis and treatment of sterility in both sexes of cattle and horses.—J. E.

Williams, W. L. (1935). **The Influence of Ante-Natal and Early Post-Natal Health of Calves upon their Vigour and Fertility as Adults.**—*Vet. Rec.* **47.** 49-59. 2 tables, 1 chart. [1 ref.]

This article describes observations made upon a herd consisting of several hundred Holstein-Friesians, formed in the centre of an old-established herd of 25,000 Hereford cattle, in a subtropical district in the southern United States of America.

Both herds were kept out of doors permanently and were dependent upon natural forage for their livelihood, the quantity and quality of which was largely determined by the rainfall. The influence of rainfall and the actual precipitation is recorded throughout the investigation, which covered a period of nearly 14 years.

The Holstein-Friesians suffered from dystrophia of the reproductive system, the most constant condition of which was hypoplasia of the vulva and vagina at the time of breeding. The mortality was high in this herd whilst the Herefords were unaffected, although there was direct contact between the two herds. The dystrophia was controlled as follows :– Mating was delayed until the animals were two years of age. Calves were removed from their dams 24 hours after birth and placed in special folding pens ; their food was restricted to one pint of milk, one

pint of lime-water and four ounces of castor oil for the first feed ; these quantities of milk and lime-water were thereafter allowed twice daily for the first week, after which whole milk was gradually substituted. At the end of one month the calves were removed to a second enclosure and fed from " stanchions " set in a readily-washed cement platform, their muzzles being allowed to become free of milk before removal from the " stanchions ". When three months old they were removed to another enclosure with similar " stanchions," given plenty of separated milk and allowed to graze. When six months old they were placed in a large enclosure with the general heifer herd, where they were wholly dependent upon grazing until the close of the first pregnancy.

Williams suggests that ante-natal and early post-natal health of calves is of primary importance in connection with the fertility and vigour of breeding animals. —K. D. Downham.

Zanzucchi, A. (1934). Ricerche epidemiologiche, etio-patogenetiche, cliniche ed anatomo-patologiche sulla Febbre Catarrale Maligna. [**Research on Malignant Bovine Catarrh**].—*Clin. vet., Milano.* **57.** 689-721. 8 figs. on 2 plates, 13 graphs. [22 refs.]

A comprehensive study of a natural outbreak has enabled the author to confirm that malignant bovine catarrh is caused by a filter-passing virus. The outbreak first started in a flock of sheep and then spread to cattle. In the early cases, the mortality rate was high, but later it dropped to about 30 per cent. Illness lasted about 20 days, the animals showing a rise in temperature, conjunctivitis, diphtheritic deposits on the mucous membranes of the head and respiratory tract, ulceration of the nasal septum, diarrhoea alternating with constipation, nervous symptoms, coma and death. On *post-mortem* examination, as well as the lesions on the mucous membranes, the liver, spleen and kidneys showed degenerative changes, the lymph glands were swollen and hypertrophy of the myocardium was evident. Haematological findings varied with the progress of the disease, the haemoglobin content was usually low and there was a low red cell count and a slow sedimentation rate of the red blood corpuscles. The white blood corpuscles remained normal in numbers, but the polymorphonuclear leucocytes were reduced whilst the eosinophiles were increased.

The author was able to transmit the disease from cows to sheep and from sheep to sheep, goats and cows by the subcutaneous injection of 5 c.c. of blood or suspensions of liver, spleen or kidneys obtained from infected animals. The material was first passed through a No. 1, 2 or 3 Chamberland candle, and the virulence of the virus was not lost after five successive passages. Further, the disease was set up in susceptible animals by natural contact. From a careful observation of the outbreak in question, it was seen that the disease ran an acute course in cattle, whereas it was subacute in sheep and goats. The author is of the opinion that sheep act as a natural reservoir for the virus. [Compare the work of Goetze, who was unable to demonstrate the presence of a filtrable virus in this disease – this *Bull.* **1.** 90].—J. A. Nicholson.

Liégeois, & Verstraete, A. (1934). Au sujet de la paraplégie hémoglobinurique du Cheval. [**Equine Myoglobinuria**].—*Bull. Acad. vét. Fr.* **7.** 213-217. [7 refs.]

The first part of this paper is a review of the present state of knowledge of the aetiology, symptoms and treatment of equine myoglobinuria compiled from reports of practitioners whose collaboration was specially obtained for the purpose. It contains no new matter.

The second part records original work carried out by the authors on the calcium content of the blood of affected animals. They find a tendency towards increase and conclude that calcium therapy is of doubtful value in the treatment of this condition.—C. DAVENPORT.

BERGH, M. (1934). **A Note on "Club Foot" (Cattle).**—*J. S. Afr. vet. med. Ass.* **5.** 128-131. 2 figs.

The author describes a condition affecting the feet of cattle on a large ranch in the Northern Transvaal. It runs a chronic course, characterized by stiffness in the forelegs and a hard bony thickening of the phalanges, with the result that the animal walks on its toes. *Post-mortem* examination showed a marked chronic ossifying periostitis affecting the phalanges. The aetiology of the condition is obscure.—E. M. ROBINSON.

FRITZSCHE, K. (1934). Die Mareksche Geflügellähme und ihre Bekämpfung. **[Marek's Fowl Paralysis and its Control].**—*Dtsch. tierärztl. Wschr.* **42.** 659-660.

The author considers that fowl paralysis is undoubtedly an infectious disease. [His opinion is based largely upon the research work of SEAGAR – this *Bull.* **4.** 533].

A differential blood cell count is not considered to be a reliable criterion for diagnosis. Amongst others of a more general nature, the following recommendations are made for the control of the disease :– all birds obviously affected with fowl paralysis should be slaughtered ; pens should be kept clear of faecal debris and should be frequently disinfected with caustic soda, and only eggs from birds having no history of disease should be used for further breeding.

—E. J. PULLINGER.

DOWNHAM, K. D., & CROMPTON, C. (1934). **Observations upon Neuritis in Fowls (So-called Fowl Paralysis) : A Quick Method of Diagnosis by Means of Nerve Smear Preparations.**—*Vet. J.* **90.** 505-507.

The authors advance the following opinions :– that, among other predisposing causes, internal parasitism is an important one ; that the causal agent may be a toxin or virus which enters the blood stream through the damaged mucous membrane, and that infiltration by leucocytic cells of parts of the nervous system follows.

The method of diagnosis advocated consists in making an impression preparation on a slide with the cut surface of a nerve and staining the smear by Leishmann's method. [The actual condition of paralysis present during life, for example, leg paralysis, should be a guide to the actual nerve selected]. They claim that, by this method, the infiltrating cells deposited in making the preparation are shown up excellently.—W. J. IRONSIDE.

ADAMEK, W. (1934). Ueber die Blutgefässgeschwülste bei den Tieren. **[Tumours of Blood Vessels in Animals].**—*Inaug. Diss. Berlin.* pp. 52. 2 tables. [180 refs.]

This is a brief review of the literature of this common group of tumours, from the time when they were first classified by VON GRAEFE (1808) as angiectasis, followed by a summary of the classification of the angiomas according to BORST (1902). This classification, which is in fairly wide use at the present day, is as follows :– (1) haemangioma (simplex or cavernosum) ; (2) haemangio-endothelioma, and (3) perithelioma. STERNBERG (1930) considers that the first group can be divided into capillary, arterial or venous types. A note is made of capillary ectasis,

a condition often mistaken for cavernous angioma – for example, angiomata in bovine livers.

A survey was made of 107 cases of angiomata from different domestic animals and from mice, rats, fowls and fish, which were encountered in the Veterinary School, Berlin, from 1926 to 1932. Eighty of the cases were haemangioma, 17 haemangio-endotheliomata and 7 were perithelioma. The tumours were more common in the dog than in the other domestic animals : they were observed in nearly every organ in the body, the skin being the most frequent predilection seat, followed by the liver, lung, heart and spleen. Multiplicity was often encountered, including the multiple haemangio-endotheliomata of fowls [recorded in this country by Blakemore and Innes (1931) in the form of an endemic].

As regards histogenesis the author briefly repeats what is generally described in text-books such as those of Borst, Ewing or Mallory, etc., that many of these tumours are, in all probability, developmental anomalies.—J. R. M. Innes.

Söderlund, H. (1934). Förlossningsförlamning hos ko i belysning av nyare undersökningar. **[New Light on Milk Fever].**—*4. Nord. Vet.-mötet. Helsingfors. 1933.* pp. 290-322. [German summary : abst. from orig.]

The author describes his attempts to estimate the therapeutic value of different compounds of calcium in milk fever. He injected solutions of the chloride, gluconate, lactate and glycero-phosphate intravenously into normal horses and examined the conductivity of the serum before and after injection. He then arranged the same salts in a table with regard to the resistance yielded *in vitro* to an electric current. Neither of these methods gave reliable results. The author therefore concludes that the therapeutic value cannot be estimated by means of these tests only, but that the best method is to compare statistical figures obtained from practitioners. He is in agreement with Starkenstein, who found that the effect of a salt is parallel to its capacity for dissociation. Examining blood samples from 104 normal cows (poor condition) he found a Ca content ranging from 4 to 7 mg. per 100 c.c. in 19 of them. He was of the opinion that these figures were in direct opposition to the hypocalcaemic theory as to the aetiological factor. In the discussion which followed, several speakers were not altogether in agreement with the author, and brought forward their own opinions as to the cause and treatment of milk fever. [The normal figure has been regarded as 7 to 10 mg. per 100 c.c. The figure of 4 mg. can hardly be accepted without further corroboration.—Ed.]

—Gustav Naerland (Farsund).

Emslie, A. R. G. (1934). **Recent Research on Poultry Nutrition. "Leg Weakness."**—*Tech. Commun. Bur. Anim. Nutrit., Aberd.* No. 5. pp. 31-43. 2 tables.

In this communication the following points are discussed :– the growth of poultry on " purified " diets ; the results of lack of vitamins A, B, C, D and E and of minerals ; the causes of leg-weakness ; mineral balance experiments and the factors governing hatchability.

In the section on leg-weakness, infestations by intestinal parasites and infections are mentioned as causal factors. The principal cause is, however, due to dietary errors, and among these are mentioned deficiency of Ca and of vitamins A, B and D and excess of Mg.

The question of slipped tendon, perosis, range paralysis or hock disease, is discussed at length and, from a careful review of the literature, it seems undecided whether this disease is due to a vitamin deficiency or to an imbalance of the mineral constituents of the diet.

The other disease dealt with, characterized by leg-weakness, is nutritional paralysis, occurring in chicks after about the third week of hatching. This condition appears to be due to a deficiency of a fraction of the vitamin B complex which is not destroyed by autoclaving. The author suggests giving liquid skim milk to the birds, or increasing the amount of dried milk at the expense of some other protein concentrate in the ration.—G. D. Shearer.

Bisschop, J. H. R. (1934). **Mineral Deficiency Diseases of Livestock in South Africa.**—*S. Afr. med. J.* **8.** 511-514.

The writer discusses the condition of aphosphorosis and the resultant osteophagia in cattle. Other points discussed in the paper are the effect of phosphate feeding on fertility, the length of the gestation period, the birth weights of calves, the weights of calves at weaning, growth and development at different ages and as reflected by body measurements, milk production and quantity and quality of beef produced. A brief mention is made of " lamsiekte ".—E. M. Robinson.

Allcroft, W. M., & Green, H. H. (1934). **Blood Calcium and Magnesium of the Cow in Health and Disease.**—*Bio-chem. J.* **28.** 2220-2228. 8 charts. [39 refs.]

The authors give a survey of the literature of blood Mg levels in animals and human beings in health and disease. They comment on the discrepancy of results recorded by various workers for normal cattle, Sjollema, in Holland, giving an average value of 1·66 mg. Mg per 100 ml. serum, and Blakemore and Stewart an average of 2·97 mg. They then tabulate their own results for Ca and Mg levels in normal cows and heifers and in cases of lactation tetany, milk fever, contagious abortion and advanced tuberculosis. They used Clark and Collip's modification of the Kramer and Tisdall method for estimating serum Ca, and a modification of the Denis procedure for the estimation of serum Mg, details of which are not given.

The samples for normal cows were taken from two sources ; one lot comprising samples from 108 cows and heifers from one herd and the other, 31 random samples from two districts. The combined results from both lots show a range of serum Ca of 8·65 to 11·65 mg. per 100 ml. serum, 85 per cent. of the values lying between 9 and 11 mg. For serum Mg, the range is 1·85 to 3·17 mg. per 100 ml. serum and, of these, 90 per cent. lie between 1·9 and 2·7 mg.

Samples of serum from cases of suspected contagious abortion were also analysed, but no significant difference was detected between those showing a positive and a negative agglutination reaction.

Thirty-two out of 35 blood samples, from animals suffering from advanced tuberculosis, showed a marked divergence from the normal. The serum Ca was slightly lowered, ranging from 8·5 to 10·5 mg., while, in 79 per cent. of the samples, the serum Mg was below the lower normal limit of 1·7 mg. found by the authors.

Blood samples were obtained from 18 cases of lactation tetany, and they also showed a decided lowering of the serum Mg ranging from 0·3 to 1·1 mg. The serum Ca values varied from 4·7 to 10·8 mg. From these figures and the clinical notes of the cases, the authors suggest that milk fever and lactation tetany may sometimes coexist.

Five cases of milk fever are recorded, showing a lowered Ca and a normal Mg figure.—G. D. Shearer.

Hinshaw, W. R., & Lloyd, W. E. (1934). **Vitamin-A Deficiency in Turkeys.**—*Hilgardia.* **8.** 281-304. 10 figs., 7 tables. [11 refs.]

The experiments reported were designed to determine the possible relation of avitaminosis A to turkey mortality and to obtain information concerning the effect on turkeys of various vitamin A levels. Sixty-four poults received a ration containing no vitamin A. Symptoms of avitaminosis A developed on the 25th day after hatching, and 100 per cent. mortality had taken place by the 44th day. Xerophthalmia was the principal symptom. Lesions were confined to mucous membranes of the head, the upper digestive tract, the respiratory tract and the bursa of Fabricus. The bursa of Fabricus, not previously reported as a seat of lesions, was affected in 44 out of 64 poults and in 37 of 42 chicks examined. A white, flaky, urate-like deposit between the thickened bursal folds was the most common manifestation. Sinusitis was prevalent. Deposits of urates in the kidneys and ureters, considered pathognomic in the diagnosis of avitaminosis A in chicks, seldom occurred in poults. Symptoms and autopsy findings in the turkeys dying in the low level vitamin A experiment, though complicated with coccidiosis and moniliasis, did not differ from those in birds receiving no vitamin A. In this experiment, the percentage mortality of the different groups varied inversely to the amount of alfalfa-leaf meal (the source of vitamin A) in their ration. Turkeys maintained according to the local custom were found to require a ration including 8 per cent. of dehydrated alfalfa-leaf meal containing approximately 130 gamma of carotene per g. for normal growth up to 30 weeks of age.—James Stewart.

Lease, Jane G., & Parsons, Helen T. (1934). **The Relationship of Dermatitis in Chicks to Lack of Vitamin B_2 and to Dietary Egg-White.**—*Bio-chem. J.* **28.** 2109-2115. 4 figs. on 1 plate, 5 charts. [24 refs.]

A dermatitis, characterized by scabby incrustations at the corner of the mouth and under the mandible, ruffled feathers and involvements of the eyes and feet, can be produced in chicks by a diet rich in dried egg-white and vitamin B_2 (basal ration I), and also by a diet deficient in vitamin B_2, containing no egg-white (basal ration II). A liver extract rich in vitamin B_2 was prepared by leaching dried liver in running water for five days and then extracting for 24 hours with 50 per cent. ethyl alcohol. The residue was poor in vitamin B_2.

Batches of chicks were fed on one of these basal diets and, when the incrustations at the corners of the mouth were moderately severe, the liver supplements were added to the ration. At the end of the test period, those chicks receiving basal ration I + liver residue were quite healthy, while those receiving basal ration I + liver extract showed severe dermatitis.

Those on basal ration II + liver extract were quite normal, while those on basal ration II + liver residue showed a severe dermatitis strikingly similar to that produced by basal ration I + liver extract.

It thus appears that the dermatitis produced by egg-white is not due to lack of vitamin B_2, although it is very similar in appearance.—G. D. Shearer.

PUBLIC HEALTH.

von Ostertag, R. (1935). Die Stellung des Tierarztes in der öffentlichen Gesundheitspflege. [**The Position of the Veterinarian in Public Health**].—*Z. Fleisch- u. Milchhyg.* **45.** 141-146.

An address delivered to the 93rd Assembly of German Biologists and Doctors in Hanover, showing the contribution of the veterinarian to the protection of the public health. In Germany, protection against animal diseases communicable to man is provided by the state veterinary services which control all the contagious

diseases of animals ; against food poisoning by the ordinary meat inspection services in control of all abattoirs ; against milk-borne diseases by the veterinary milk inspection services organized under the new German Milk Act of 1930 and, finally, against the sale and distribution of animal food products, which might be dangerous to health, by the special organization for the veterinary inspection of shops, markets, etc.—F. BULLOCK.

I. SEELEMANN, M., & HADENFELDT, A. (1933). Ueber weitere Befunde von Strept. pyogenes (Rosenbach) in der Milch. (**Further Records of** *Str. pyogenes* (**Rosenbach**) **in Milk**].—*Z. Fleisch- u. Milchhyg.* **44.** 25-27. [2 refs.]

II. ZAVAGLI, V. (1933). Zum Vorkommen und zur Bedeutung der Coli aerogenes-Keime in der Milch. [**Occurrence and Importance of** *Bact. coli* **and** *Bact. aerogenes* **in Milk**].—*Z. InfektKr. Haustiere.* **45.** 110-134. 4 tables. [55 refs.]

I. Examination of a sample of milk showed the presence of β haemolytic streptococci which were non-capsulated, pathogenic for mice and failed to ferment sorbite. There appeared to be no evidence of any disturbance of the milk secretion although, later, there was some evidence of mastitis. It is concluded that such a strain is different from the American animal strains of *Str. pyogenes* which ferment sorbite, as do other similar streptococci of animal origin.

[Although there was no evidence of associated human disease, the failure to ferment sorbite would suggest the streptococcus to be of human origin].

II. The differentiation of *Bact. coli* from *Bact. aerogenes* in drinking water is carried out, but this differentiation is not usually applied to the examination of milk. It is known that both *Bact. coli* and *Bact. aerogenes* may be found in faeces although the latter organism may also be found elsewhere, for example, in soil. Both types are normally found in raw commercial milk and the variation in the numbers encountered depends upon the hygienic precautions obtaining in the milk industry. It is desirable that comparable results may be issued from different laboratories. In this work, the differentiation of *Bact. coli* from *Bact. aerogenes* shows that, in milk, their numbers are normally about equal. If *Bact. aerogenes* predominates, it is assumed to be due to soiling by human agency. No strains appeared to survive flash pasteurization.—R. LOVELL.

EMPEY, W. A., SCOTT, W. J., & VICKERY, J. R. (1934). **The Export of Chilled Beef – The Preparation of the "Idomeneus" Shipment at the Brisbane Abattoir.**—*J. Coun. sci. industr. Res. Aust.* **7.** 73-77.

The chief features of the preparation of the meat for the initial shipment of chilled beef from the Brisbane abattoir are given. In order that chilled beef imported from Queensland may be landed in good condition in England, the bacterial contamination immediately after slaughter, which is normally acquired under the conditions prevailing in most Australian meat works, must be greatly reduced. The means by which this reduction was obtained are described, particular emphasis being given to the reduction from the chief sources of infection, viz., the hides and hoofs of the cattle. An altered chilling (pre-cooling) procedure was also introduced. The use of new technique of slaughter, dressing, handling and chilling has normally resulted in the reduction of the contamination to approximately one-seventh of its former average.

Details are also given of the methods of handling and stowage employed in the shipment.—E. MUNCH-PETERSEN.

Anthony, D. J. (1935). **Electricity for the Slaughter of Poultry.**—*Vet. Rec.* **47.** 59-60.

The electrolethaler, commonly used for the electric stunning of pigs and sheep prior to slaughter, can be used quite as effectively for poultry. Its application to turkeys is described, and its use recommended for the slaughter of poultry.

—D. J. Anthony.

Clarenburg, A. (1934). Bacteriologisch vleeschonderzoek bij paratyphose van het rund. De beoordeeling van Z.G. locale paratyphus uit een oogpunt van vleeschkeuring. [**Meat Inspection for Paratyphoid Infection in Animals**]. —*Tijdschr. Diergeneesk.* **61.** 907-920. 3 tables. [19 refs.] [Abst. from. English, French and German summaries].

Salmonella enteritidis (formerly *Bact. enteritidis* Gärtner) was found in the internal organs of a number of cattle. The author found that the distribution of the organisms in the musculature was very irregular and therefore states that it is insufficient to examine only a few pieces of meat from a carcass when investigating this infection.—J. E.

Fromme, W. (1933). Zur Ursache von Nahrungsmittelvergiftungen durch Enteneier. [**Causes of Food Poisoning by Ducks' Eggs**].—*Dtsch. med. Wschr.* **59.** 655-656. [3 refs.]

Twenty-five outbreaks of food poisoning have been observed within a year, in which 143 persons were affected and two died. The illnesses were connected with the consumption of ducks' eggs. The use of ducks' eggs in salads appeared to be the common means of introducing the infection, and one such case is described in detail, in which the suspected food consisted of sausage meat and potato salad.

Salmonella typhi-murium (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) recovered from the stools of the patients, could not be demonstrated in sausage meat of the same consignment as that eaten, but was recovered from the remains of the salad, in the preparation of which a duck's egg had been used. Eliminating tests definitely indicated the egg as the vector of infection. These facts, combined with previous reports, leave no doubt that ducks' eggs are a possible source of food poisoning and are a warning against the eating of raw ducks' eggs. They also demonstrate the need for suitable safeguarding methods on duck farms. There appears to be no doubt that the infection may come either from inside the egg, or by contamination of the eggshell.

—Norman Hole.

Beller, K. (1933). Die Bedeutung des Geflügels für die Entstehung von Lebensmittelvergiftungen. [**Significance of Poultry in Food Poisoning**]. —*Z. Fleisch-u. Milchhyg.* **43.** 365-369.

This article deals mainly with the infection of poultry including geese, ducks and pigeons, with members of the paratyphoid group. The literature on the finding of such human pathogens as *Salmonella enteritidis* (formerly *Bact. enteritidis* Gärtner) and *S. typhi-murium* (formerly *Bact. aertrycke*, or *Bact. enteritidis* Breslau) in various species and their eggs is reviewed. The author concludes that birds may contract infection in their youth, suffer from diarrhoea and recover, but that the organisms may remain dormant in their tissues and the infection may thus be passed on to the next generation. No new facts are apparently brought to light.

—R. Lovell.

THERAPEUTICS.

Bergman, H. D., Amadon, R. S., Craig, R. A., Milks, H. J., & Quitman, E. L. (1934). **Report of the Committee on Proprietary Pharmaceuticals [Amer. Vet. Med. Ass.]**—*J. Amer. vet. med. Ass.* **85.** 514-515.

The committee, with the co-operation of various business firms and officials of the " Food and Drug Administration ", has done good work in protecting livestock owners from quack remedies and has given advice as to whether certain preparations come within the designation of food or drug.

The committee has also acted as consultant for the National Formulary Revision Committee with regard to veterinary medicines, many of which have been standardized for purposes of dosage.—J. E.

Clark, A. J. (1934). **Individual Variation in the Response to Drugs.**—*Lancet.* **227.** 1149-1150. [2 refs.]

The wide range of individual variation in response to a standard dose of any drug, quite apart from the question of idiosyncrasy, is not as generally appreciated as it ought to be. In this paper, Clark deals with the difficult subject of making some kind of a quantitative estimate of its extent. In order that a dose should not be too dangerous for clinical use, it is considered that the chance of death should be less than one in 10,000. Human patients vary much more than laboratory animals, but useful figures may be obtained from experiments on large numbers of animals ; thus it is shown that a dose of digitalis equal to about half the mean toxic dose (enough to kill 50 per cent. of the experimental animals) would not produce death once in 10,000 animals. The individual variation concerning some other drugs, however, is much greater, and it can be shown that one-sixth of the mean lethal dose of neoarsphenamine will kill one out of 10,000 animals, while in some instances individual variation is much greater still. A method is given for estimating the chance that a dose may produce an occasional death and it is stated that a dose equal to the median lethal dose, less 3·7 times the standard deviation, will probably kill not more than one individual in 10,000.

—E. L. Taylor.

Pöpsel, F. (1933). Ueber die intravenöse Anwendung von Akridinfarbstoffen nebst eigenen Versuchen mit Entozon bei Rindern. **[Intravenous Injections of the Acridine Dyes, particularly of " Entozon ", in Cattle]**.—*Inaug. Diss. Hanover.* pp. 51. 2 figs., 1 table. [37 refs.]

The introduction to this subject is followed by a section dealing with the purely chemical aspect of the various dyes of the acridine series.

The author refers extensively to the literature relating to the intravenous use of " rivanol " and " trypaflavine ", which appear to have been, until recently, the most widely used members of this group. " Trypaflavine " has been employed in such different diseases as trypanosomiasis, foot and mouth disease, contagious abortion and purpura haemorrhagica, but the results were not successful.

The observations recorded in this thesis were made with a view to ascertaining the value of " entozon " granulate when given intravenously. The dose used was 1 to 2·5 g., per 100 kg. body weight, given as a 1 per cent. solution. The dye was eliminated by the kidney, intestine and udder ; in the last instance 15 hours were taken. Tissue staining is observed if the animal is slaughtered not more than 40 hours after the dose is given. No satisfactory results were obtained when the dye was used in cases of mastitis, septicaemia and pneumonia in calves due to pyogenic organisms.—N. S. Barron.

I. de Blieck, L., & Jansen, J. (1934). Onderzoek van enkele desinfectiemiddelen (therapogeen, sublimaat, carbol, citopogeen). [**Disinfectant Trials with Therapogen, Sublimate, Carbolic and Citopogen**].—*Tijdschr. Diergeneesk.* **61.** 578-583. [Abst. from English, French and German summaries].

II. de Blieck, L., & Jansen, J. (1934). Onderzoek van enkele desinfectiemiddelen. (2de mededeeling). (Citopogeen, lysol, lysoform, therapogeen, carbol). (Ten opzichte van b. coli). [**Trials with Some Disinfectants**].—*Ibid.* 1203-1205. [Abst. from English, French and German summaries].

I. The authors give the detailed results of *in vitro* tests with therapogen, carbolic acid and citopogen. Cultures of *Bact. coli*, *Pseudomonas pyocyanea* and *Salmonella typhi-murium* (formerly *Bact. aertrycke* or *Bact. enteritidis* Breslau) were employed as test organisms. The phenol coefficients were given as follows :– therapogen, about 0·3 and citopogen, about 1·5.

II. This paper deals with the disinfectant powers of citopogen, lysol, carbolic acid, therapogen and lysoform, all tested on *Bact. coli.*

Their relative disinfectant power was found to be in the order given above. —J. E.

Garrod, L. P. (1934). **A Study of the Chick-Martin Test for Disinfectants.**—*J. Hyg., Camb.* **34.** 322-332. 5 tables. [2 refs.]

The Chick-Martin test for disinfectants consists of testing the bactericidal power of the product against organisms [generally *Salmonella typhi* (formerly *Bact. typhosum*)] suspended in water which contains a standardized amount of organic matter. The latter is obtained by the addition of a weighed quantity of dried, sterile human faeces. The bactericidal power of the disinfectant is compared with that of phenol. This test, like all other tests which have the same object in view, is unsatisfactory and is apt to give very irregular results.

The present author has studied the role played by the faecal suspension. He found that in addition to being difficult to prepare, the influence exerted by this organic matter depended largely upon the smallness of the particles, a factor which could not be standardized. The sub-division of faecal particles markedly increased the number of bacteria which survived disinfection. Furthermore faecal suspensions are unstable and rapidly form heavy deposits in which bacteria can survive for long periods. Tests carried out with yeast cells showed that these organisms form a stable suspension which can replace faecal suspensions and give surprisingly satisfactory results in the Chick-Martin test. Further investigations along these lines are being carried out.—E. J. Pullinger.

Velu, H., & Zottner, G. (1934). La chimioprévention de la dourine par le naganol est-elle réalisable pratiquement ? [**The Practicability of " Naganol " Prophylaxis in Dourine**].—*Bull. Soc. Path. exot.* **27.** 261-264. [1 ref.]

This article is a preliminary study of the protective value of " naganol " against dourine in horses and donkeys. The authors first discuss the question of dosage and fix this at 0·006 g. per kg. body weight. They find that such an injection gives protection for ten days and, further, that the same dose will sterilize the system where infection has taken place up to five days previously. They conclude that such injections, given every 15 days, will effectively protect travelling stallions against the disease.—C. Davenport.

von Jancsó, N., & von Jancsó, H. (1934). **The Role of the Natural Defence Forces in the Evolution of Drug-Resistance of Trypanosomes. I. – A Method for the Exclusion of the Natural Defence Mechanisms from Chemo-**

therapeutic Processes.—*Ann. trop. Med. Parasit.* **28.** 419-438. 5 tables. [29 refs.]

This article records experiments on the trypanosome response to the action of drugs in mice in which the defence mechanism had been eliminated by splenectomy and the intravenous injection of electro-colloidal copper. In non-splenectomized mice the administration of minimum doses of trypanocidal drugs (styryl compounds and tartar emetic) may effect a cure without relapse ; a certain number of trypanosomes are killed by the drug, and the remainder may be killed by the antibodies, or a few may survive and cause the appearance of a relapse strain. In splenectomized mice a certain number of organisms are killed but, in the absence of antibodies manufactured by the spleen, an early reappearance of trypanosomes in the blood occurs ; these belong to the original infecting strain. In the majority of the recorded experiments, the Rieckenberg blood platelet adhesion test was used to determine the nature of the strain of the reappearing trypanosomes.

The trypanocidal power of germanin, which largely depends upon an opsonic effect, was greatly reduced by the administration of electro-colloidal copper which inhibits the capacity to phagocytose corpuscular elements from the blood.

—U. F. Richardson.

Pockels, W. (1934). Experimentelle Studien über die Wirkung des Retikuloendothels auf die Toxizität und die Heilwirkung der Arsenobenzole. **[Action of the Reticulo-Endothelial System on the Toxicity and Curative Action of Arsenobenzol].**—*Arb. Staatsinst. exp. Ther. Frankfurt.* No. **29.** pp. 12-45. 19 tables. [71 refs.] [Abst. from abst. in *Trop. Dis. Bull.* **31.** 823].

The course of infection with *Trypanosoma prowazeki* in the white mouse was not affected by removing the spleen or blocking the reticulo-endothelial system and these procedures had little or no effect on the action of " neosalvarsan " in infected animals. The toxicity of the drug was not altered.—J. E.

Lièvre, H. (1934). Données experimentales sur les agents thérapeutiques de la distomatose à *Fasciola hepatica*. **[Tests on Drug Treatment of Fascioliasis].** —*Ann. Parasit. hum. comp.* **12.** 511-520. 1 table. [21 refs.]

The author has carried out a number of tests *in vitro* on the action of some toxic reagents on *F. hepatica*. The various substances were tried in strengths varying between 0·01 per cent. and 10 per cent., the results of the tests being given in the form of a table. The most promising substance tried was rose of Magdala ; this dye is excreted exclusively in the bile, and Lièvre observed that a 1 per cent. solution killed the liver fluke *in vitro* in 13 minutes, whereas 40 minutes were required for gentian violet, which was the next most active dye. It is concluded that, in theory, this drug should be a valuable fasciolicide, as it can be given intravenously without risk of injuring the kidneys, is excreted through the liver and is toxic for the liver fluke.—E. L. Taylor.

Spindler, L. A. (1934). **The Effect of Daily Administrations of Ferrous Sulphate and Copper Sulphate to Pigs on their Resistance to Infection with the Swine Nodular Worm,** *Oesophagostomum dentatum*.—*J. Parasit.* **20.** 325-326.

Test pigs received daily doses of 3·7 c.c. of a dilute solution (560 mg. of each dissolved in 1 American gallon [= 3·785 litres] of water) of ferrous sulphate and copper sulphate. Test pigs and control pigs alike were then given equal numbers of infective larvae of *O. dentatum* to ascertain whether the chemicals modified the resistance of the experimental animals. Three separate tests were carried out,

showing conclusively that more worms developed in the treated pigs. The copper and iron, however, apparently had a very favourable action on the pigs, as the test pigs grew better than the controls.

It is suggested that the small doses of copper and iron may have had a beneficial "homeopathic" action on the worms.—E. L. Taylor.

Krone, R. (1934). Ueber den Einfluss der Kohle auf die Wirkung des Santonins als Anthelmintikum. [**Influence of Charcoal on the Anthelmintic Action of Santonin**].—*Inaug. Diss. Berlin.* pp. 27. 1 fig., 2 tables. [18 refs.]

It has been claimed by other investigators that the toxicity of oil of chenopodium can be greatly reduced, without interfering too much with its anthelmintic action, by mixing the dose with charcoal, on to the particles of which the drug becomes absorbed. Krone has carried out experiments on this method of administering santonin to dogs. After a series of 22 trials on experimental dogs and on five controls, using santonin alone, he concluded that, although the admixture of charcoal greatly reduced the toxicity of the santonin, it also had a marked adverse influence on its anthelmintic action.—E. L. Taylor.

I. Wessel, G. (1933). Ueber die Beziehungen zwischen Kohle und Oleum Chenopodii und ihren Einfluss auf dessen pharmakologische Wirkung und klinische Verwendung. [**The Effect of Charcoal on the Therapeutic Action of Ol. Chenopodii**].—*Inaug. Diss. Berlin.* pp. 30. 1 fig., 8 tables. [16 refs.]

II. Mager, H. (1933). Ueber Beziehungen zwischen Kieselgur und Oleum Chenopodii. [**The Effect of "Kiesselgur" on the Therapeutic Action of Ol. Chenopodii.**—*Ibid.* pp. 13. 10 tables, 3 charts. [21 refs.]

I. This paper is the description of an experiment to attempt to reduce the toxicity of oil of chenopodium by adsorbing it on charcoal. A number of dogs infested with ascarids were dosed with varying amounts of the chenopodium-charcoal mixture in the form of pills. According to egg counts made before and after dosage, the mixture was fairly efficacious and less toxic than oil of chenopodium given alone or in a bland oil.

II. Infusorial earth was found to be a poor adsorbing agent for oil of chenopodium. Mixtures of the oil and earth were tested both *in vitro* and *in vivo*, and the results were unsatisfactory.—W. von Düring (Wilmersdorf).

Albert, H. (1934). Ueber die Wirkungen des Oleum Chenopodii und seiner Bestandteile Askaridol und Parazymol am isolierten Dünndarm des Hundes. [**Action of Oil of Chenopodium and its Constituents, Ascaridol and Parazymol, on the Isolated Small Intestine of Dogs**].—*Inaug. Diss. Berlin.* pp. 22. 3 charts. [10 refs.]

The effects of oil of chenopodium, of ascaridol and of parazymol were tried separately on portions of the isolated intestines of dogs, the usual method of registering changes in tonus and in rhythmic contractions being employed. The test substances were injected into the intestine, so that they acted upon the mucous surface, and it was found that stimulation rapidly followed, there being an increase both in the rhythmic contraction and in the tonus with all three substances, but particularly with ascaridol. A local inflammatory reaction was also noticed to occur near the part where the substances were injected. Atropine, even in very small amounts in the bath of Ringer's solution in which the intestine was placed, acting on the serous surface, was found to depress the reaction and, in larger doses, to prevent it from occurring.—E. L. Taylor.

ROTTHEGE, E. (1933). Behandlungsversuche bei Magen- und Darmstrongylose der Jungrinder mit Flores Cinae und Derriswurzelextrakt. **[Trials with Wormwood and Derris Root Extract on Gastro-Intestinal Strongylosis in Young Cattle].**—*Inaug. Diss. Hanover.* pp. 38. [16 refs.]

After reviewing the literature on the treatment of parasitic gastritis in cattle, the author gives an account of his own experiments with a decoction of wormwood and a cold water extract of derris. The method of judging the effect of the drug was by means of a rough count carried out on a sugar floatation, a 50 per cent. solution of sugar being used and two drops being removed from the surface by a wire loop.

The wormwood decoction was tried on five cattle in doses varying between 50 and 200 c.c., diluted with different quantities of water, varying up to 6,000 c.c., but no indication of any anthelmintic action was obtained. Derris extract was tried on seven cattle, some of which were almost in a dying condition : these were given very large doses, but on *post-mortem* examination the worms were observed still to be alive. Egg counts carried out on other cattle failed to show any anthelmintic action on the part of the derris extract, but it was interesting to note that cattle could withstand doses of 2 to 3 g. of powdered derris root for each 50 kg. body weight without harmful effects being produced. A principal factor in the cause of parasitic gastritis in cattle is thought to be the turning of newly weaned or young cattle out to grass without proper housing and without concentrated food.—E. L. TAYLOR.

LEBLANC, F., WRIGHT, T., & TAYLOR, J. B. (1934). **Oil of Chenopodium and Chenopodium Plants for the Eradication of Round Worms in Swine.**—*Bull. S. Dak. agric. Exp. Sta.* No. 283. pp. 20. 9 figs. [Copied *verbatim* from *Exp. Sta. Rec.* **71.** 537].

The studies here reported, the details of which for the years 1929 to 1933, inclusive, are presented in tabular form, indicate that if pigs are badly infested " with worms, worming them once by an efficient method as soon as possible after weaning will reduce feed costs during the subsequent feeding period. Worming the pigs a second time resulted in increased rather than decreased feed costs as compared with pigs wormed only once. The results of two tests indicate that *Chenopodium* plants may be used as a forage crop to eliminate worms and reduce grain and supplements required to produce 100 lb. of gain ". Cultural methods for development of *Chenopodium* are in progress.

MARCENAC. (1934). Pouvoir anthelmintique de certains composés chlorés du butane dans la cylicostomose du cheval. **[Anthelmintic Action of Some Chlorine Compounds of Butane against Cylicostomes of the Horse].**—*C. R. Acad. Sci., Paris.* **198.** 510-512. [4 refs.] [Copied *verbatim* from *J. Helminth.* **3.** 8. Signed B. G. P.]

Marcenac has found that dichlorobutane and chloro-butylene ($CH_3.CCl_2.CH_2.CH_3$ and $CH_3CCl : CH.CH_3$) are very valuable anthelmintics against cyclicostomes in horses.

The dose is 0·18–0·2 c.c. per kgm. of body weight. The drugs appear to be retained for some time in the intestine since their characteristic odour is present in the faeces for 4 or 5 days and in the breath for 6 or 7 days. This retention and slow absorption favour the destruction of larvae encysted in the mucosa.

MIDDELDORF, R. (1934). Kombinierte Behandlung der Sklerostomiasis des Pferdes mit Tartarus stibiatus (intravenös) und Tetrasol-Kapseln (per os). **[Combined Treatment of Equine Sclerostomiasis with Tartar Emetic and " Tetrasol "].**—*Dtsch. tierärztl. Wschr.* **42.** 689-691.

This is an account by a general practitioner. The importance of sclerostomiasis in all its aspects is stressed. This is followed by general remarks on the disease and its treatment. The author has had good results with " tetrasol " capsules and the intravenous injection of tartar emetic. " Tetrasol " is a proprietary preparation and contains 50 per cent. of carbon tetrachloride with thymol and other compounds. The symptoms, history, diagnosis, treatment and course of six cases are given in detail. The results obtained were uniformly good, and were checked by microscopic examination of the faeces.

The intravenous dose of tartar emetic for horses six to 18 months old is 0·5 to 0·75 g. in 100 c.c. of distilled water, and for older animals 0·75 to 1 g. in 100 to 150 c.c. of water. It can be repeated every five or six days, according to the physical state of the patient. Three to four doses are usually sufficient.

Half-year-olds are given two to three " tetrasol " capsules at a time ; yearlings and 18-month-old animals three to four, and those above that age, four to five, after 12 hours' complete fast. The dose is administered by the balling gun, after the tartar emetic (in some cases only a quarter of an hour later). The combined treatment has the advantage of attacking the adults and the larval forms outside the bowel at the same time.—A. W. N. Pillers.

Bugge-Naess, R. (1934). Terapi med calciumpraeparater i veterinaerpraksis. **[Calcium Therapy in Veterinary Practice].**—*4. Nord. Vet.-mötet. Helsingfors, 1933.* pp. 268-290. 2 tables. [English summary : abst. from orig.]

During the past three years the author has treated about 300 cases of milk fever with Ca therapy. He now gives intravenously 25 g. calcium chloride dissolved in 2,300 c.c. water. The percentage of relapses is stated to be 5, whereas with the air inflation method it is reckoned to be 6·5. The advantage of the chemotherapeutic treatment may be summed up as follows :- (1) a higher yield of milk ; (2) the production of mastitis is avoided and there is no aggravation of existing forms thereof ; (3) the percentage of fatal cases falls to almost nil, and (4) less expense for the cattle owner. The author has also used the same treatment for 91 cases of "food-poisoning" (autointoxication) with striking results. Nineteen cases of post-parturient paraplegia and seven cases of convulsions have likewise been treated with favourable results in most cases.—Gustav Naerland (Farsund).

Grimmett, R. E. R., & Sharland, F. B. (1934). **Some Characteristics of " Limonites " used in the Cure and Observation of Bush Sickness.**—*Trans. R. Soc. N.Z.* **64.** 191-211. 7 tables, 2 graphs. [17 refs.]

This paper is of interest to research workers in iron deficiency. Certain limonites are useless, while others are curative when fed to cattle and sheep in iron-deficient areas.

The authors give the result of their work on analyses of the samples of ore, and show that the rate of solubility in acid-reducing substances can be correlated with the feeding value.—C. S. M. Hopkirk.

Bedford, G. A. H., & Wilken-Jorden, T. J. (1934). **Researches into Dips and Dipping. C. Miscellaneous. The Effect of Dosing Aloes to Tick-Infected Cattle.**—*Onderstepoort J. vet. Sci.* **2.** 267-269. 1 table.

The dosing of tick-infested cattle with aloes either in one dose of 8 to 15 drams or with 30 to 60 g. administered over five days did not have any effect on the ticks, which were of several different species.—E. M. Robinson.

—. (1935). **Names of Endocrine Preparations.**—*Brit. med. J.* Feb. 2nd. 211-212. [1 ref.]

A study of the literature on endocrinology shows the utter confusion of its terminology, due both to the intricacy of the subject and to imperfect knowledge. It appears that the anterior pituitary gland secretes a number of compounds with slightly different structures and different physiological actions, and that similar but not identical hormones may be isolated from the urine. Until these substances have become firmly established in clinical practice and provided with official names in the Pharmacopoeia, it is recommended that they should be called by some descriptive phrase which, although cumbersome, would prevent a single substance being called by a dozen different names.—J. A. NICHOLSON.

POISONS AND POISONING.

HOFFMANN, J. A. (1934). Kalkstickstoffvergiftung von Schweinen und Rindern. [**Calcium Cyanamide Poisoning in Swine and Cattle**].—*Münch. tierärztl. Wschr.* **85.** 581-582.

This article is interesting, inasmuch as it records for the first time cases of calcium cyanamide poisoning in animals. The animals affected were three cows, two sows and two weaned pigs ; they received the poison in their drinking water, near which a sack of it had been discarded. They suddenly became ill with high temperatures and shivering fits, but lingered on, losing condition for upwards of six weeks, during which time the sows farrowed. The *post-mortem* pictures were very similar in both species. The liver was enlarged and marble-coloured and haemorrhagic areas were apparent in the mucous membrane of the stomach and in the glands of the pylorus. The litter of one of the sows became affected with dermatitis of the mouth and necrosis, and subsequent sloughing off of their tails. The cows produced little milk, losing condition and appetite very quickly. No method of successful treatment was discovered.—JAMES STEWART.

—. (1934). **The Dangers of Carbon Bisulphide.**—*Brit. med. J.* June 2nd. 998. [1 ref.]

This annotation calls attention to a recent publication on this subject by the Factory Department of the Home Office which explains the risk of poisoning through inhalation of carbon bisulphide. The vapour of this parasiticide is toxic, even in low concentrations, and has a profound effect upon the nervous system, a concentration of some 600 parts per million being sufficient to produce serious disturbance if inhaled for an hour. Nausea, headache, giddiness and muscular weakness are among the symptoms which first appear and these may lead to almost complete paralysis. Slow recovery usually takes place after removal from the toxic vapour.—E. L. TAYLOR.

FAURE. (1934). Intoxications alimentaires dues à l'ingestion de plantes exotiques vénéneuses. [**Plant Poisoning**].—*Rec. Méd. vét. exot.* **7.** 16-20. [1 ref.]

The diagnosis and treatment of cases of plant poisoning are often unsatisfactory, and this is particularly the case in North Africa, where little study has been given to indigenous poisonous plants. Animals usually avoid harmful plants but, when they are first turned out in the spring, they often show no discrimination in this respect, and the livestock in North Africa are no exception to this generalization. The author has come across a proved case of poisoning in a human being

by *Ornithogalum amoenum*, in which the symptoms were those of an acute gastro-enteritis. On feeding the corms of *Ornithoga* to dogs, he was able to produce haemorrhagic gastro-enteritis and death in five to six days. *Perralderia coronopifolia* has been shown to be dangerous to sheep and dromedaries, and the author gives short accounts of other poisonous North African plants.—J. A. Nicholson.

Clawson, A. B. (1934). **Some Symptoms and Lesions Produced by Stock-Poisoning Plants.**—*J. Amer. vet. med. Ass.* **85.** 179-192.

The author gives *Sarcobatus vermiculatus* as an example of a plant which contains oxalates. It causes severe losses amongst sheep, which show typical symptoms of oxalate poisoning. The most pronounced lesions are an acute parenchymatous nephritis and the presence of calcium oxalate crystals in the renal tubules. Milkweed, *Asclepias eriocarpa*, is given as an example of a plant which causes a rise in temperature in cases of poisoning. The principal lesions seen in sheep are congestion of the lungs, kidneys and alimentary tract and the concentration of large numbers of leucocytes beneath the epithelium of the stomachs. Death occurs in five to six days. Various members of the heath family produce nausea in cattle, sheep and goats, as does also the so-called sneeze-weed, *Helenium hoopesii*. In the latter case, poisoning may result from either a large single dose or from repeated small doses of the plant. Certain species of delphinium and oak leaves cause severe constipation, which is followed by diarrhoea. When the latter occurs, death is almost certain to result. Of the plants which produce muscular spasms and convulsions, the most common is the water hemlock.

Finally, plants which produce cirrhosis of the liver are discussed. The best known of these are the *Senecio* species.—J. A. Nicholson.

Steyn, D. G. (1933). **Plant Poisoning in Stock and the Development of Tolerance.**—*Onderstepoort J. vet. Sci.* **1.** 149-156. 2 tables. [14 refs.]

Attempts to produce tolerance in sheep, by feeding gradually increasing amounts of *Asclepias physocarpus* (milkweed) and *Centaurea picris*, are recorded. Continuous administration of non-toxic amounts of milkweed produced no tolerance, but rather a tendency for the development of cumulative effects. On the other hand, *C. picris* did produce tolerance in sheep, as shown by the feeding of a toxic dose to one sheep which had been fed gradually increasing amounts of the plant.

Tolerance is here distinguished from immunity, and is described as " an increase in resistance to plant poisons of a non-albuminoid nature ".

—G. D. Shearer.

Beath, O. A., Draize, J. H., Eppson, H. F., Gilbert, C. S., & McCreary, O. C. (1934). **Certain Poisonous Plants of Wyoming Activated by Selenium and their Association with Respect to Soil Types.**—*J. Amer. pharm. Ass.* **23.** 94-97. [5 refs.]

Earlier work has shown that the two-grooved milk vetch, *Astragalus bisulcatus*, possesses poisonous properties. These vary, however, and it has been found that those plants yielding an offensive odour are more toxic than plants lacking this characteristic. The former plants grow on shale formations and are rich in selenium. Other plant species growing on shale formations have also been found to contain selenium and, with it, an increased toxicity. Livestock grazing upon such plants are variously affected, and it is probable that the toxicity of the selenium is influenced by the presence of other substances with which it may combine. The most usual symptoms in cattle are dullness, stasis of the gastro-intestinal tract,

abdominal pain, excitement, paralysis, respiratory failure and death. Acute and chronic types of poisoning occur. In acute cases, no *post-mortem* changes can be found, but in chronic cases there is gastro-enteritis and the parenchymatous organs exhibit varying degrees of congestion.—J. A. Nicholson.

de Leur, F. M. (1934). Vergiftiging bij runderen met nicotine door de intacte huid. [**Poisoning of Cattle through the Skin with Nicotine**].—*Tijdschr. Diergeneesk.* **61.** 1160-1161. [English, French and German summaries : abst. from orig.]

A nicotine spray for fruit trees was applied to the backs of four cows as a fly repellent. Shortly afterwards, the animals became uneasy, staggered when walking, showed muscular spasms of the limbs and respiratory distress and died within an hour of the onset of symptoms. The author estimated that each animal had received 160 mg. of nicotine and, since the owner who had mixed the nicotine and soap solution with bare arms was unaffected, he ascribes the sudden onset of symptoms to the fact that the cows' skin had already been damaged by the flies.

—J. A. Nicholson.

Babjee, S. M. (1934). **Notes on Cattle Mortality Caused by Drinking Rubber Latex.**—*Indian vet. J.* **11.** 124-126.

The author records several cases of cattle drinking the latex obtained from rubber trees. The day after ingestion the animals become dull, there is a rise in temperature and tympanites develops. A few faeces coated with latex are passed, but an obstinate constipation soon sets in and death follows on the fourth or fifth day. On *post-mortem* examination, impaction of the rumen, due to the solidification of the latex, is found ; the intestines may be empty but, at times, they contain solid pieces of rubber. The latex itself is considered to be non-poisonous, and death is probably due to intestinal intoxication. Treatment is symptomatic.

—J. A. Nicholson.

Simon, F. A., Simon, Margaret G., Rackemann, F. M., & Dienes, L. (1934). **The Sensitization of Guinea-Pigs to Poison Ivy.**—*J. Immunol.* **27.** 113-123. 2 figs. [11 refs.]

Previous workers have shown that extracts of poison ivy, *Rhus toxicodendron*, produce typical vesicular lesions in susceptible persons when applied to the skin, and the authors have studied this phenomenon in guinea pigs. The application of a 10 per cent. extract of the plant in vaseline on four consecutive days produced reddening, swelling and excoriation of the skin, and a very light application 12 days later produced in 24 hours a typical reaction which was not seen in control animals. The sensitiveness involved the entire skin. Intravenous or intraperitoneal injections did not produce sensitization, and the response of guinea pigs after treatment with cow pox vaccine was small. It appears from these experiments that the sensitiveness of man to poison ivy is acquired by previous contact with the plant.

—J. A. Nicholson.

Fardel, R. (1934). Contribution à l'étude de la toxicité du robinier faux acacia (Robinier pseudo-acacia). [**The Toxicity of** *Robinia pseudoacacia* **– Black Locust Plant**].—*Thesis for Docteur vétérinaire, Lyons.* pp. 58. [28 refs.]

R. pseudoacacia contains in its bark and wood two glucosides, robinine and robitine, and a protein, robin. Robin and robitine act as medullary poisons. The leaves are slightly toxic, but the flowers are not ; the toxic principles resist heat and drying.

The susceptibility of animals to the poisons varies with the species; it decreases from solipeds, through carnivores, birds and ruminants, to rodents, to which it is practically innocuous.

Young animals are more susceptible than adults, and females more than males, pregnant females being particularly susceptible. Elimination is through the urine, and is slow. The medulla seems to be the only part affected by the poison. The flesh of an animal killed by *Robinia* can be eaten without harmful effects.

—G. D. Shearer.

Thomas, E. F. (1934). **The Toxicity of Certain Species of Crotalaria Seed for the Chicken, Quail, Turkey and Dove.**—*J. Amer. vet. med. Ass.* **85.** 617-622. 1 fig. [6 refs.]

Following the deaths of a number of hens, in the crops and gizzards of which *Crotalaria spectabilis* seeds were found, the author carried out experiments to determine the toxicity of various species of *Crotalaria*. It was found that *C. spectabilis* seeds are toxic to chickens, quail and doves when eaten in large quantities. Acute or chronic poisoning may result. The acute type kills the birds in from one to ten days and, on *post-mortem* examination, small haemorrhages are seen in the cardiac fat, the flesh is dark and a jelly-like substance covers the liver. In the chronic form, birds remain ill for some months and, on *post-mortem* examination, the liver is the only organ found affected. This is dull grey in colour, adheres to the adjacent organs and has a thickened capsule. Turkeys appear to be unaffected by large quantities of *C. spectabilis* seeds, and the other *Crotalaria* species tested were not toxic to chickens or quail.

—J. A. Nicholson.

Nusshag, W. (1934). Solaninvergiftungen beim Schwein. [**Solanin Poisoning in Swine**].—*Tierärztl. Rdsch.* **40.** 349-351. 1 fig.

The author carried out an investigation into the sudden death of 30 to 40 adult fattening pigs. Shortly after feeding, the animals showed clonic muscular spasms, convulsions, paralysis, loss of consciousness and death in a few hours; in those animals which recovered, the symptoms passed off in two days. On *post-mortem* examination, the small intestine appeared congested, the liver was swollen and very friable, and evidence of haemorrhage between the muscle fibres of the heart was observed. Chemical analysis revealed the presence of large amounts of solanin in the stomach contents, and it transpired that the animals had been receiving a diet largely consisting of old sprouted raw potatoes.

—J. A. Nicholson.

Girard, F. (1934). Le férulisme dans la région de Meknès. [**Poisoning by *Ferula* in Morocco**].—*Thesis for Docteur vétérinaire, Lyons.* pp. 60. [19 refs.]

In this communication the question of poisoning by *Ferula communis* is discussed. A detailed record is given of 14 outbreaks among the stock of settlers in Morocco. Treatment is recommended by subcutaneous injections of extract of ergot. Diagnosis and methods of differentiation from piroplasmosis are discussed, and the *post-mortem* findings are recorded.—G. D. Shearer.

Curasson, G. (1934). Sur la toxicité de la sécrétion buccale des sauterelles. [**Toxicity of the Mouth Secretion of Locusts (for Cattle)**].—*Bull. Acad. vét. Fr.* **7.** 377-382. 1 fig. [6 refs.]

After a swarm of locusts, the vegetation is contaminated by a secretion from the mouth which, the author suggests, is toxic enough to cause death in cattle, buffaloes and sheep.

The mouth secretion used in these experiments was obtained from *Locusta migratoria*, var. *migratorioides*, *Schistocerca gregaria* and *Cyrtacanthracis ruficornis*. Administration by subcutaneous injection and *per os* caused death in rats and guinea pigs. In the sheep and goat the lethal dose was found to be 2 to 4 c.c. given subcutaneously and 8 to 15 c.c. *per os*. The nature of the poison is not suggested.—G. D. Shearer.

PHYSIOLOGY.

le Gall, J. (1934). Contribution à l'étude de col de l'utérus. [**The Neck of the Uterus of Domestic Animals**].—*Thesis for Docteur vétérinaire, Alfort*. pp. 72. 6 figs. [30 refs.]

This anatomical, physiological and pathological study of the cervix uteri applies particularly to the mare, with some few comparative references to the other domestic species. Histological structure and nervous apparatus are described in detail, since they are intimately concerned in the physiological alterations that occur during pregnancy and at parturition. The structure is largely elastomuscular and the nervous supply is derived from the sympathetic, parasympathetic and vasomotor systems. Except at parturition and during coitus, the role of the cervix is essentially protective.

Morbid conditions are of greatest importance in relation to parturition and sterility; those described include :– fibrotic induration, torsion, atresia, endocervicitis, cystic degeneration and neoplasmata. Of the latter, squamous epithelioma is given as the most common, but mention is also made of polypi, fibroma, sarcoma and encephaloid carcinoma.—J. W. Emslie.

Ralston, A. G. (1934). **Method of Inducing Oestrum in the Mare.**—*J. R. Army vet. Cps.* **5.** 178-179. [2 refs.]

This is a short account of the author's attempts to promote oestrum in barren mares or mares with irregular oestrum on a stud farm in India. Two methods were tried. The first consisted of the injection of prepared urine taken from mares in an advanced state of pregnancy. Of six so treated, two responded by showing oestrum within a month and both subsequently carried foals. The second method involved the use of prolan (pituitary extract – anterior lobe). Of 19 mares treated, 13 showed oestrum within a month, three being in foal to the first covering, one to the second covering and a further one to covering following a second dose of the drug. —C. Davenport.

I. Gunn, R. M. C. (1934). **Studies in Fertility in Sheep. I. Artificial Production of Ejaculation and the Characters of the Spermatozoa in the Resultant Ejacula.**—*Vet. Rec.* **14.** 1379-1382. 2 figs.

II. —. (1934). **Artificial Insemination.**—*Ibid.* 1382-1383.

I. This is a summary of an article to be published as a bulletin of the Council for Scientific and Industrial Research, Commonwealth of Australia. Electric stimuli have been successfully employed on a considerable scale to bring about the ejaculation of semen by rams. The most suitable stimulus was provided by a 50 cycle alternating current at 30 volts or by a rapidly interrupted current of similar voltage. It was applied by placing one pole four to six inches within the rectum and the other, a sterilized needle inserted to the depth of the transverse process, into the longissimus dorsi muscle opposite the third or fourth lumbar vertebra. Restraint in the extended lateral recumbent position was most convenient.

The ejaculum, about four times the normal in volume, was strikingly increased

by the prior injection of pituitary preparations, and much increased by the prior injection of acetylcholine. Urine contamination occurred in less than 0·1 per cent. of cases, and most of the spermatozoa were present in the second of the three fractions.

Taking movements as the indication of life, the longevity of the spermatozoa in over 400 ejaculates was investigated. The maximum length of life, when stored at 14°C., was 48 hours, increased to 76 hours when the surface of the ejaculate was covered with liquid paraffin. Storage at 4°C. increased the longevity to 12 days on the average. In ejacula obtained after injections of acetylcholine and pituitary preparations, the length of life of spermatozoa approached what may be regarded as the maximum, extending to even 43 days with the former and 64 days with the latter.

Limited observations on the insemination of ewes with artificial ejacula showed that it was not inferior to naturally ejected semen.

II. This editorial mentions the extensive application of artificial insemination in Russia, and discusses the conditions of animal husbandry in which this practice can be used with advantage. Its importance to sire-importing countries is emphasized. The significance of GUNN's work with sheep [see above] is pointed out.

—R. F. MONTGOMERIE.

SATO, S., & HOSHI, S. (1934). **Studies on the Reproduction in the Mare. III. The Oestrous Duration and Oestrous Cycle.**—*J. Jap. Soc. vet. Sci.* **13.** 237-252. 17 tables, 5 charts. [Orig. in English : Japanese summary].

This article records the results of investigations made by the authors in Japan into the duration of oestrum, the length of the oestrous cycle and the interval elapsing between parturition and the next onset of oestrum. The observations were made on Korean mares and on mares at the government stud farms. The normal duration of oestrum was found to be four to 14 days in the former and three to 15 days in the latter. The duration was longest in March and shortest in July. The oestrous cycle in the Korean mares was found to vary from 17 to 29 days and in the stud farm mares from 15 to 33 days. The duration was not constant in any individual, and heavy condition shortened it. The interval between parturition and forthcoming oestrum was found to vary between five and 12 days. There was a seasonal influence, the interval being longest in March. Age reduced the period.

—C. DAVENPORT.

MALAN, A. I. (1934). **Mineral Metabolism in Relationship to Production in Livestock.**—*S. Afr. med. J.* **8.** 514-517. 1 table.

The comparative importance of the various mineral elements in the food of livestock is discussed. The benefits claimed for iodine feeding could not be substantiated. The value of an iron supplement in the ration is doubtful except for the prevention of anaemia of certain types. The most important deficiency in South Africa is undoubtedly that of phosphorus, which is easily diagnosed by blood analysis and remedied by the addition of a phosphorus supplement to the diet. A protein deficiency undoubtedly exists at certain times of the year. The use of a salt lick is recommended in the prevention of sodium deficiency.

—E. M. ROBINSON.

PEIRCE, A. W. (1934). **The Yield and Composition of the Milk of the Merino Ewe.**—*Aust. J. exp. Biol. med. Sci.* **12.** 7-12. 1 table. [8 refs.]

Since there appears to be little or no information available concerning the yield or the composition of the milk of merino ewes, an investigation was under-

taken with six merino ewes, varying in age from two to six years. The yield was estimated by weighing the lambs immediately after suckling, which was only allowed at certain intervals. Observations were made over periods of 48 hours during the third and ninth weeks of lactation.

The average daily yield of milk was 1,205 g. during the third week and 650 g. during the ninth week. The average percentage compositions at the two stages were :– total solids, 17·66 and 19·29 ; casein, 3·43 and 4·38 ; lactalbumin, 0·81 and 0·85 ; fat, 7·41 and 7·90 ; lactose, 4·93 and 4·81 ; ash, 0·86 and 0·90 ; phosphorus, 0·095 and 0·13, and calcium, 0·20 and 0·21. The gross energy was 1·13 and 1·22 calories per g. respectively at the two stages. These results, which are tabulated for each individual, are compared with values obtained with other breeds of sheep by previous workers. The yield is about two-thirds that of mutton breeds, but there are no outstanding differences in the composition.

—W. I. B. Beveridge.

Radeff, T. (1934). Ueber den Haemoglobingehalt neugeborener Haustiere und Icterus Neonatorum. [**Haemoglobin Content of New-Born Domestic Animals and Icterus Neonatorum**].—*Wien. tierärztl. Mschr.* **21.** 518-522. [24 refs.]

The haemoglobin content of the body of the foetus and the blood of the suckling and adult animal was estimated in the case of the dog, cat and goat.

The body of the new-born animal contains a relatively greater quantity of haemoglobin than that of the suckling or adult animal of the same species, as is shown by the following figures given in g. per kg. body weight.

	Foetus	20 – 30 days old	Adult
Dog	8·74 – 13·38	3·12 – 5·47	9·33
Cat	10·88 – 12·34	3·48 – 7·76	4·7 – 5·44

As respiration in the foetus takes place by the slower process of diffusion, a higher haemoglobin content is to be expected, and it is considered that the differences observed, the figures for one species being compared with those of another, are to be explained by the differences in placentation and the rate of growth from the day of birth.

The above estimations were repeated at high altitudes, when it was discovered that not only was the haemoglobin content of the blood of adult animals greater but the total quantity of haemoglobin in the foetus was also greater.

From birth, there is a rapid reduction in the quantity of haemoglobin, which must be regarded as a normal physiological process. According to Joest, the occurrence of a pathological icterus neonatorum has not been proved. Jaundice in young animals is usually caused by an umbilical infection.—N. S. Barron.

Niven, J. S. F., & Robison, R. (1934). **The Development of the Calcifying Mechanism in the Long Bones of the Rabbit.**—*Bio-chem. J.* **28.** 2237-2242. 6 figs. on 1 plate, 1 table. [7 refs.]

Previous work on calcification in the long bones has been carried out on the hypertrophic cartilage from the long bones of rats and rabbits on a rachitogenic diet. The experiments described were conducted on normal healthy rabbit cartilage. The presence of the calcifying mechanism was demonstrated in hypertrophic cartilage and osteoid tissue even before deposition of Ca salts had taken

place. Moreover, the calcifying mechanism of these healthy tissues showed greater activity than that of hypertrophic cartilage of rats fed on a rachitogenic diet.

Immersion of the tissues for 24 hours in acetone, or desiccation *in vacuo* had no adverse effect on the inorganic or phosphatase activity.

Heating at 50°C. for 30 minutes did not inhibit the inorganic or phosphatase mechanisms, but heating at 55°C. appeared to inactivate the phosphatase, although even a temperature of 60°C. had little effect on the inorganic mechanism.

—G. D. Shearer.

Abbott, A. C., & Prendergast, J. (1934). **Histological Variations in Animal Thyroids in Western Canada.**—*Canad. med. Ass. J.* **31.** 465-473. 10 figs., 3 tables. [13 refs.]

Detailed histological examinations were made of 667 thyroid glands from cattle, sheep, horses, minks, foxes and swine. The specimens were from animals with a wide range of age. Photomicrographs are given illustrating the variations which were found. Hyperplastic glands with small acini and little colloid are generally found in the young animals. The colloid increases with age. In the very old animals, the increased colloid is accompanied by flattened cells and an increase in the fibrous tissue between the acini.—Henry Dryerre.

TECHNIQUE.

Donham, C. R., & Fitch, C. P. (1934). **A Study of Preservatives for Rapid-Test Brucella abortus Antigen.**—*J. Amer. vet. med. Ass.* **85.** 782-787. [5 refs.]

Phenol, formalin, tricresol and trypan blue were tested as antigen preservatives. The former was definitely superior to each of the others, and the most suitable concentration of phenol was 0·5 per cent. Storage at 40°C. materially assisted preservation, regardless of the preservative employed. The addition of gentian violet and brilliant green tended to reduce the keeping quality of the antigen. The authors conclude that antigen preserved in any of the ways employed in these experiments, and stored under good average conditions, will retain its sensitiveness for longer than six months.—R. F. Montgomerie.

Orla-Jensen, Anna D. (1934). **About the Application of Aesculin for the Identification of Bacteria.**—*Acta path. microbiol. scand.* **11.** 312-322. 3 tables. [6 refs.] [Orig. in English].

Lactic acid bacteria, largely taken from the permanent stock classified and described by the author in "The Lactic Acid Bacteria" [(1919). *K. danske vidensk. Selsk. Skr.* **8.** 2.], have been examined for their power of splitting aesculin. Bacteria may cause the fluorescence of aesculin to disappear, may produce a black colour with citrate of iron, or may produce acid, the latter giving a measure of the fermentation of the glucose set free by the splitting process. Most streptococci examined split aesculin, the exceptions being *Str. agalactiae* (*mastitidis*) and *Str. thermophilis*. Amongst the rod-forms of lactic acid bacteria only the streptobacilli gave any noticeable fermentation of aesculin. All the members of the *coli-aerogenes* group tested gave positive colour reactions. [Edwards, S. J. – this *Bull.* **4.** 303 – has pointed out the use of aesculin for differentiating *Str. agalactiae* in milk samples].

The colour reaction with citrate of iron fails in substrates in which the nitrogen supply is poor.

It is pointed out that the quantitative determination of *Bact. coli* in milk by the use of aesculin may not be reliable, as lactic acid bacteria may be able to grow in the substrate used and give black colonies as well as *Bact. coli*.—R. Lovell.

Ginzel, E. (1934). Ueber Erfahrungen mit den Anreicherungsnährböden nach L. Müller und F. Kauffmann. Ein Beitrag zur bakteriologischen Fleischuntersuchung. [**The Enrichment Media of Müller and Kauffmann**].—*Inaug. Diss. Vienna.* [Abst. from abst. in *Wien. tierärztl. Mschr.* **21.** 651].

The author tested the enrichment methods of Müller and of Kauffmann for the cultivation of paratyphoid bacteria from the carcasses of infected animals. Neither method was individually markedly superior to the ordinary culture methods, but the two methods used together were of value in the demonstration of meat poisoning organisms. The author advocates a full trial of Kauffmann's method in bacteriological meat inspection laboratories in Austria.—J. E.

Mason, J. H. (1934). **A Note on the Cultivation of Anaerobes.**—*Onderstepoort J. vet. Sci.* **2.** 29-32. 1 table. [3 refs.]

The author describes a method of obtaining and sterilizing a serum-haemolysed cell mixture. Rapidity and cleanliness in working and in the collection of the blood are the most important factors ; the vein should be penetrated by the needle at the first thrust. Ether was found to be the most satisfactory preservative for the mixture ; its growth-stimulating effect on anaerobes was noted and it could be added to agar or other media at any time. Boiled, alkalized serum and serum-haemolysed cells were not found to have any growth-stimulating effect on anaerobes. —E. M. Robinson.

Höckl, J., & Červinka, F. (1934). Nový trichinoskop Reichertův. [**The New Reichert Trichinoscope**].—*Zverolék. Rozpravy.* **8.** 145-149. 3 figs. [1 ref.] [Translated *verbatim* in *Prag. tierärztl. Arch.* **14.** 167-171].

The authors give a detailed description of the new type of Reichert trichinoscope. The projected pictures are clear and distinct and the magnified trichinae, as seen on the screen, are 2·5 to 3 cm. long.—E. Pribyl (Erno).

MISCELLANEOUS.

Valade, P. (1934). Le rôle pathogène du froid. [**The Pathogenic Role of Cold**]. —*Rec. Méd. vét.* **110.** 646-662. [26 refs.]

Cold exerts a devitalizing effect on body tissue, thus allowing pathogenic organisms to invade the body. The effect of cold is influenced by its degree, and this is illustrated by the results produced in experiments carried out by various workers ; these may be briefly summarized as follows :– the general effects of severe cold, which result in death, are due to cardiac failure or cerebral anaemia ; the local effects of severe cold, as in frost bite, are due to cellular wall destruction, whilst less severe cold allows tissue invasion by micro-organisms.

Opinions are divided concerning the actual pathogenicity of cold – whether it is due to a shock or is a direct, a vasomotor, a nervous or a meteorologically related action.

Acclimatization to cold produces the best means of combating its ill effects. —H. E. Bywater.

Treillard, M. (1934). L'insectarium expérimental de l'Institut Pasteur de Saigon : conception et fonctionnement. [**Experimental Insectarium at the**

Pasteur Institute, Saigon].—*Bull. Soc. Path. exot.* **27.** 863-865. 6 figs. on 2 plates, 1 plan. [2 refs.]

The writer describes and illustrates the experimental insectarium at Saigon which was completed in 1932. It is a single-story building consisting of a laboratory, two cages for host animals and an observation corridor with which nine cages for insects communicate. The host cages each communicate with an insect cage. The insect cages measure 2 × 2 m. and can be put into communication with one another as required. The floor is of cement with excavations in which soil, rocks, natural vegetation or water may be placed. Through the centre of each cage runs a canal with flowing water, the current and volume of which can be regulated.

The main object in the construction of the insectarium has been a simplified reproduction of natural conditions which are so essential for successful experiments with insect vectors.—J. S. Steward.

Schoop, G. (1934). Keimgehalt in Alkohol. [**Bacterial Content of Alcohol**]. – *Dtsch. tierärztl. Wschr.* **42.** 752-754. 1 fig., 2 tables. [4 refs.]

It has been found that high concentrations of alcohol – between 70 and 96 per cent. – are frequently contaminated with both aerobic and anaerobic bacteria. Out of 16 samples of alcohol, 11 were contaminated. Such alcohol may not sterilize itself in the course of a year. The use of alcohol for the sterilization of instruments, hands or the field of an operation is of very doubtful value. Sterile alcohol can be obtained by filtration through a Berkefeld filter.—E. J. Pullinger.

OFFICIAL AND OTHER REPORTS.

Great Britain. (1934). **Economic Advisory Council Committee on Cattle Diseases. Report.** pp. 161. 21 tables. London: H.M. Stat. Off. [8vo] [2s. 6d.]

The committee was appointed in November, 1932, to enquire into the possibility of reducing disease, particularly tuberculosis, in milch cows and of improving the milk supply. The report is not abstractable in a limited space: only the ground covered can be indicated here.

It was concluded that the incidence of bovine tuberculosis among cows is probably as high in Great Britain as anywhere else in the world, at least 40 per cent. being positive to the tuberculin test. Contagious abortion was stated to be equally prevalent and its eradication to be very difficult, as is also the case with tuberculosis. The incidence of Johne's disease varies in different parts of the country, and mastitis affects some 30 per cent. of milch cows. An enquiry was made into the importance of these diseases for human health and the conclusions reached were in agreement with the present consensus of opinion.

The failure of existing legislation for the control of tuberculosis and contagious abortion was recognized and also the need for reorganizing the classes of milk for sale.

In order to reduce disease in milch cows and to improve the milk supply, the committee made certain important recommendations, which provided for a greatly increased veterinary public health service under decentralized control by local authorities, and the eradication of bovine tuberculosis by the formation and registration of tuberculosis-free herds. Technical and financial assistance was suggested to this end. It was considered that new regulations would also be required to govern the movement of livestock.

New designations for milk – certified, pasteurized, sterilized and uncertified – were drawn up to replace the existing ones.

The work on contagious abortion and Johne's disease, at present being considered by the Agricultural Research Council, is commended, and a plea is made for its energetic support.—J. E.

INDIA. (1934). **Annual Report of the Imperial Council of Agricultural Research for the Year 1932-33.** [DAS, C.] pp. 61. 4 tables. New Delhi: Govt. India Press. [8vo] [6 annas] [8d.]

It is clear that the problems of animal health and animal husbandry are not receiving the attention they deserve. The Council itself has produced progressive schemes for development, but adequate funds have not been provided, and the annual Government grant has been suspended. Nevertheless, eight Provinces and the State of Hyderabad have appointed Veterinary Investigation Officers and it is stated that valuable results are already being produced.

The appointment of a protozoologist to the Imperial Institute of Veterinary Research at Muktesar is still in abeyance, though it was sanctioned in 1931.

A scheme designed to make a thorough study of tuberculosis and Johne's disease in India has also been postponed. Progress is reported in connection with the drafting of legislative measures for the control of animal diseases.

The question of establishing a uniform curriculum for all the Veterinary Colleges in India has been revived. It would appear that a three years' course is contemplated: the entrance qualification has been raised during recent years and this would entail cancellation of the organization for the much more advanced and lengthy curriculum already in force in at least one college.—G. K. WALKER.

INDIA, BIHAR AND ORISSA. (1934). **Annual Report of the Civil Veterinary Department for the Year 1933-34.** [DAVIS, R. T.] pp. xxxii + 33. 16 tables, 1 photograph, 1 map. Patna: Govt. Printer. [8vo] [Rs.1-3].

Apart from the Patna Veterinary College, the work of the province is divided into three areas, North Bihar Range, Central Range and Orissa Range. The technical staff consisted of the Director of Veterinary Services (Major P. B. RILEY), the staff of the Veterinary College (Principal, R. J. DAVIS), a Disease Investigation Officer (L. SAHAI), an officer in charge of each Range, 13 veterinary inspectors and 189 veterinary assistant surgeons.

Although contagious diseases of animals were prevalent, the general health during the year was comparatively good. The disastrous earthquake in January is stated to have been responsible for 4,000 casualties among cattle.

Encouraging results followed the use of goat virus inoculation which was used in many outbreaks of rinderpest. A new vaccine for blackleg, issued by the Imperial Institute of Veterinary Research, Muktesar, was adopted.

The Disease Investigation Officer enquired particularly into the distribution of nasal granuloma and "stringhalt" in cattle, both of which diseases appear to be widely prevalent. Experiments were made on the treatment of rinderpest with kaolin and cyllin.

The Veterinary College at Patna recorded another year of successful work but the number of students was low. The Patna cattle breeding and dairy farm in connexion with the college gave satisfactory results. The number of veterinary hospitals and dispensaries remained stationary, but there was a very satisfactory increase in the number of patients. The need for a greater number of these institutions is admitted.—G. K. WALKER.

BURMA. (1933). **Report on the Veterinary Department For the Year ending 31st March 1933.** [MITCHELL, D. T.] pp. 27. 11 tables, 2 graphs, 3 maps. Rangoon: Supt. Govt. Print. & Stat. [4to] [Rs.2-8] [3s. 9d.]

As the report was restricted by government orders to 15 pages [apart from appendices], the information available is limited. The staff remained materially unchanged from the previous year.

The mortality of animals was higher in 1933 and totalled nearly 84,000 head, of which 23,500 deaths were due to contagious disease, mostly rinderpest.

Facilities were still lacking for the systematic control of rinderpest by block (district) immunization, and all that could be done was the serum treatment of susceptible animals and control by stand-still orders in actual outbreaks.

Foot and mouth disease of a mild nature caused 204 deaths only, though it is enzootic over wide areas. Haemorrhagic septicaemia caused 1,575 deaths. The other common infections did not cause much loss.

The development of the Veterinary College at Insein is under consideration by the government. In the meantime, Burmese recruits, who are to receive veterinary training, will have to be sent to an Indian veterinary college.

A list of technical bulletins for use by the staff (in English and Burmese) is given.

The Research Laboratory at Insein, [PFAFF, G.] was mainly concerned with diagnosis. With regard to surra it was found that " naganol " in doses of 4 g. per 100 lb. body weight intravenously every 42 days definitely gives protection against small daily injections of virulent blood.

An attempt was begun to produce osteoporosis experimentally in five young horses, which were placed on a special diet.

The field veterinary research officer [SMITH, J.] studied, *inter alia*, the diseases of elephants and has prepared a special report.

Numerous appendices and three maps give much information of a statistical nature.—J. E.

FEDERATED MALAY STATES. (1934). **Annual Report of the Veterinary Department for the Year 1933.** [WHITWORTH, S. H.] *Federated Malay States Govt. Gaz.* Suppl. Sept. 7th. pp. 12. Federated Malay States : Govt. Press. [8vo].

STRAITS SETTLEMENTS. (1934). **Annual Report of the Veterinary Department for the year 1933.** [WHITWORTH, S. H.] pp. 9. 9 tables. Singapore : Govt. Printer. [fcp] [50 cents] [1s. 2d.]

STAFF.—Three European members retired during the year. Dr. S. H. Whitworth was appointed Director of Veterinary Research and Veterinary Adviser, Malaya. The post of Principal Veterinary Officer was abolished.

At the end of the year, the nominal European veterinary staff of the F.M.S. numbered four and that of the S.S. two ; there were, in addition, 14 Asiatic assistant veterinarians, most or all of them being graduates of Bengal Veterinary College, Calcutta.

The expenditure of the veterinary staff of the F.M.S. totalled $121,000, whilst that of the S.S. was $68,000. The revenue collected as quarantine and attendance fees was $8,400 and $69,000 respectively : the finances of the S.S. thus nearly balance. These sums represented a decrease of about 12 per cent. as compared with 1932.

ANIMAL DISEASES.—The more dangerous infectious diseases, such as rinderpest and rabies, which are present to the north of the peninsular, i.e. in Siam, or in countries normally in commercial connection with the F.M.S. and the S.S., were successfully excluded by legislative prohibition or efficient quarantine control.

A small and quickly controlled outbreak of rinderpest and one of foot and mouth disease occurred at Singapore in quarantine. Rabies was diagnosed in one

dog in Penang and in four dogs in Perak : preventive vaccination was applied to dogs on a large scale.

Coccidiosis in sheep, first observed in 1932, broke out again in the wet period of 1933 in imported Australian sheep, about one-third of 1,000 sheep being affected.

Outbreaks of swine fever were not observed, though many cases diagnosed at meat inspection at Penang were reported.

Animal Husbandry.—An increase in poultry, pig and buffalo breeding is reported. The new dairy herd at Singapore increased to 172 animals.

The animal census for the S.S. was 400 horses, 18,000 cattle, 19,000 buffaloes, 28,500 sheep and goats, 108,000 pigs and 20,000 dogs.

Details of the imports and exports of live animals are given for 1932 and 1933. Imports, chiefly of swine, sheep, goats and cattle, greatly exceeded exports.—J. E.

—. (1934). **Report of Work in Animal Pathology by the Massachusetts Station.** —*Bull. Mass. agric. Exp. Sta.* No. 305. pp. 56-59. [Copied *verbatim* from *Exp. Sta. Rec.* **71.** 526].

Included in this account of the work of the year are findings under the poultry disease elimination law and routine examinations, pullorum disease investigations, including (1) cause of doubtful reactions, (2) infectivity of droppings, and (3) viability of *Salmonella pullorum*, both by H. Van Roekel and associates ; and infectious laryngotracheitis field experiments, distribution and epizootiology studies of infectious laryngotracheitis, the desiccation and preservation of infectious laryngotracheitis virus, and acute avian paralysis or neurolymphomatosis, all by C. S. Gibbs.

United States of Ameriga, State of Nevada. (1934). **Biennial Report of the State Board Stock Commissioners for the Period July 1, 1932, to June 30, 1934, Inclusive.** [Callaway, F., Dangberg, H. F., & Cazier, H. H.] pp. 34. Carson City : State Print. Off. [8vo].

The State Board employs five persons in its Division of Animal Industry, of whom three appear to be veterinarians, one on whole-time duty.

The report contains a short, comprehensive account of the livestock industry in the State, including statistics.

Points of special interest are the following :– rabies still occurs sporadically, but causes little loss ; immunization against bacillary haemoglobinuria in cattle is practised with success ; equine encephalomyelitis caused great losses in the summer of 1932, but was quiescent in 1933, when a vaccine was used on a large number of horses, but its immunizing value was not readily determinable. Dourine was discovered in Nevada in 1929 and is still present.

In 1931 Nevada was declared as a modified Tuberculosis-free Accredited Area, being the ninth state to achieve this distinction. Tests for re-accreditation, which involves retesting every three years, were in progress in the period under review.

Bovine contagious abortion was actively combated under a State plan and many accredited herds were registered. The work will shortly be included in a scheme, under the control of the bureau of Animal Industry, involving the whole of the State.—J. E.

United States of America. (1933). **Report of the Division of Veterinary Science, Michigan State College of Agriculture and Applied Science, East Lansing.** [Giltner, W.] pp. 56. [8vo].

This is the report of the Dean of the Veterinary School incorporated in Michigan State College. After an introduction which includes a list of the staff,

the heads of departments present their own reports. The routine and research work are described, but only the latter can be dealt with here.

EXPERIMENT STATION REPORT.

SECTION OF ANIMAL PATHOLOGY.—[HALLMANN, L. T.] Work on the breeding diseases of cattle and sheep, Johne's disease, helminthiasis in sheep, infection with acid-fast bacteria, pneumonia in swine and rickets in the calf are briefly referred to.

B. J. KILLHAM, Extension Specialist, reports on his work on the organization of state control measures for bovine contagious abortion and horse bot infestation. A system of accreditation is in use for the control of the former and is progressing very favourably, no less than 309 out of 426 herds included in the scheme having been freed from infection. This section furnishes illuminating instructions on what can be done by co-operation between government veterinary practitioners, county agents and farmers. All farmers supplying milk, either raw or subject to pasteurization, to the town of Jackson, have to submit their cows to the blood agglutination test.

SECTION OF BACTERIOLOGY.—[GILTNER, W.] E. D. DEVEREAUX reports briefly on his work on dairy bacteriology. C. S. BRYAN also gives a list of his scientific papers. He is of opinion that mastitis " can be controlled, and further spread prevented by the use of vaccines."

I. F. HUDDLESON continued his work on brucellosis. [See this *Bull.* **5.** 193].

W. L. CHANDLER worked on avian coccidiosis with special reference to the isolation of oocysts from faeces. With regard to the killing of oocysts in faeces it was found that, of numerous chemical disinfectants, all except preparations containing free chlorine or iodine were useless. The presence of organic matter, however, renders hypochlorites inert very quickly. Further research is therefore necessary.

H. F. STAFSETH reports favourable results in the treatment of blackhead in turkeys by colloidal iodine. He found that lead shot is poisonous to ducks and that autogenous vaccines were useful in the control of roup [simple coryza] in fowls.
—J. E.

BELGIAN CONGO. (1933). Service Vétérinaire. **[Report of the Veterinary Service of the Province of Katanga, Belgian Congo, for 1932].** [JUSSIANT].—*Bull. agric. Congo belge.* **24.** 329-337. 7 tables.

The department consisted of five Belgian veterinary officers and four Belgian stock inspectors.

CONTAGIOUS BOVINE PLEURO-PNEUMONIA.—The history of an epizootic which broke out in May of 1932, the origin of which could not be determined, is given. The affected area had been stocked with cattle for the first time in 1928, and no cases of the disease were observed before 1932. All the 2,000 cattle had to be slaughtered, and the land was left unoccupied for two years.

TUBERCULOSIS.—No statistical information is available, but a scheme for early enquiry into bovine tuberculosis is outlined.

TRYPANOSOMIASIS.—The question is at present being investigated from the indirect aspect, a tsetse fly survey having been launched.

Brief reference is also made to contagious bovine abortion, anthrax and anaplasmosis.

The livestock industry is relatively young, and the importations on the scale of previous years are not being maintained, as locally bred stock is now becoming available.

A veterinary laboratory has been set up at Luputa.—J. E.

BOOK REVIEWS.

WOOLDRIDGE, G. H. (1934). **Encyclopaedia of Veterinary Medicine, Surgery and Obstetrics. Volume I. Veterinary Medicine. Volume II. Veterinary Surgery and Obstetrics.** pp. cxxiv + 1,652. (2 Vols.) 362 figs., 6 plates. London : Humphrey Milford, Oxford University Press. [2nd Edit.] [8vo] [£6. 6s.]

These two volumes, with their red covers, serviceable binding and convenient size, are now thoroughly familiar to all English-speaking veterinarians and may justly be said to have satisfied a need which had been felt by different classes of workers in the field of veterinary science, and to have made their mark in many parts of the world.

The man who uses an encyclopaedia does so either because his library must of necessity be small, because a summary of the available knowledge will satisfy him, or because he is in a hurry. He expects to be able to turn to the essence of the information in the shortest possible time and, in a veterinary encyclopaedia, to find some mention of every kind of animal disease which has a name in the English language. The qualities of accessibility and completeness may therefore be regarded as of equal importance with the amount and excellence of the information.

It is the essential nature of encyclopaedias for articles on the many varied subjects to be of unequal merit and, if we allow that, it must be agreed that the first edition answered the requirements very well, and the second edition has rectified many small errors and omissions and brought the whole up to a higher standard of excellence. The indexes of 50 or more pages at the end of each volume are well composed and make the finding of the required information as simple as possible.

The first edition appears to have met with particular appreciation among workers interested in tropical medicine ; in the second edition special attention has therefore been paid to bringing the sections on tropical diseases up-to-date.

Some chapters have been rewritten, including those on actinomycosis, actinobacillosis, milk fever and braxy ; new chapters have been added on lamb dysentery, spinal anaesthesia, surgical narcosis with avertin and nembutal, gland grafting, vitamins, hormones and other subjects. The table of posology which appeared in the first edition has been replaced by a veterinary pharmacopoeia which has been compiled in accordance with the British Pharmacopoeia for 1932 and gives the strengths and doses according to both the metric and apothecaries' system.

As everyone realized when they first appeared, these volumes have come to stay ; they are an invaluable aid to the practitioner, the worker in public health and the laboratory man, or to anyone who wishes to turn to a useful summary of up-to-date information on anything concerning disease in animals.

—E. G. KNIGHT.

SEIFRIED, O. [Vorstand des Instituts für Tierpathologie der Universität München]. (1934). Lehrgang der Histopathologie für Studierende und Tierärzte. **[Course of Instruction in Histopathology for Students and Veterinary Surgeons].** pp. viii+195. 142 figs. Berlin : Julius Springer. [8vo] [RM.23.40].

The author explains that this book has been arranged with a view to simplifying the study of histopathology, and that more attention has been paid to principles underlying pathological changes than to the compilation of a list of facts. The book is divided into three sections. The first section deals with general pathology and is comparable with that of most text-books on the same subject. The second section deals with the special pathology of the individual organs, the alterations produced by the various diseases being described in the organ in which they most

commonly occur ; for example, tuberculous alterations are described in the lungs, but not in other organs. A feature of this section is the attention paid to the histological changes produced by swine fever in a variety of organs, in view of their bearing on the diagnosis of the disease.

The third section deals with the principal causes of pathological alterations, and the types of changes associated with the various aetiological groups. A marked feature of the book is the excellence of the illustrations, but no information is given on pathological technique.

[The system adopted for the approach to the study of histopathology appears to be sound, but the field of utility of the book will be limited by the lack of detail, which would necessitate further reference to more complete text-books].

—U. F. RICHARDSON.

KOLLE, W. [Director, Institute of Experimental Therapy & Chemicotherapeutical Research, " George Speyer-Haus "], & HETSCH, H. [Professor, Institute of Experimental Therapeutics, Frankfort]. (1934). **Experimental Bacteriology in its Applications to the Diagnosis, Epidemiology and Immunology of Infectious Diseases.** [Translated from German by D. ERIKSON]. Edited by J. EYRE [F.R.S., Edinburgh, F.Z.S., M.D., M.S., D.P.H., Director, Bacteriological Department, Guy's Hospital]. pp. 1,205. (2 Vols.) 200 text figs, 118 plates. [numerous refs.] London : George Allen & Unwin Ltd. [7th Edit.] [4to] [30s. each vol.]

Although the original book, of which this is a translation, has run through a number of editions, this is the first time that " Kolle and Hetsch " has been made available in English. The fact that translations have also appeared in French, Italian, Spanish and Russian speaks for its popularity and its reliability as a guide to the science and art of bacteriology.

In this publication we have the first-hand views of pupils and colleagues of Robert KOCH, the great master of this subject.

This work consists of two volumes. The morphology and biology of pathogenic organisms are first studied and these are followed by a general discussion of infection and immunity, particular attention being paid to serological diagnostic methods and bacterio- and serotherapy. The specific diseases of human beings are then treated individually and references are made to analogous infections in animals.

From the view-point of the student of the bacteriology of human diseases, the book is undoubtedly a valuable addition to the existing literature. Although each subject is treated in a comprehensive manner, the essentials stand out very prominently from the background of facts of purely academic interest.

To the veterinary student, it is not without its disadvantages. Although comparatively few infectious diseases of animals are discussed, those which are described make the publication rather disappointing, as the terminology, in so far as English-speaking students are concerned, has been so confused that the information contained is sure to be misleading except to those already acquainted with the subject. As an example the following passage might be quoted from Vol. I, p. 508 :–

" Closely allied to the fowl cholera bacillus is the Bacillus suisepticus which in 1882 was discovered by Schütz and Löffler to be responsible for **Swine Fever.** This bacillus occasionally occurs in the respiratory passages of healthy pigs and is often found as a secondary infective agent in these animals. It participates in this way in swine plague which is caused by a filterable virus although it is by no means so common as Bacillus suipestifer which belongs to the hog cholera group."

Again, with reference to haemorrhagic septicaemia in animals, the authors refer to fowl cholera and swine fever as the most important forms. Apart from mere mention of the name, the disease in bovines is overlooked. Other statements

to which exception must be taken are those attributing actinomycosis in animals to fungus infection from cereals and some cases of actinomycosis in man to the consumption of milk.

To the medical profession in particular there is no doubt that these volumes will prove very useful and, as expressed by Prof. Eyre who has edited the English edition, they should receive as hearty a welcome as was accorded to the original.

The illustrations are well-chosen and are a feature of the books.

The publishers are to be commended on their work, as the attractive manner in which the books have been produced invites reading.—GWILYM O. DAVIES.

WIGGLESWORTH, V. B. [M.A., M.D., Lecturer and Milner Research Fellow in Medical Entomology, London School of Hygiene and Tropical Medicine]. (1934). **Insect Physiology.** pp. x+134. 13 figs., 1 table. [297 refs.] London : Methuen & Co. Ltd. [8vo] [3s. 6d.]

The volume under review is one of a series of monographs on biological subjects published by Messrs. Methuen. The author is eminently suitable for the subject chosen, being well known as a pioneer in research on the digestion, respiration and excretion of insects.

The present volume deals with the general physiology of insects, the grosser functions of the organs and tissues, and the mechanisms co-ordinating these functions. There are separate sections on the integument, respiration, the circulatory system, digestion, excretion, nutrition and metabolism, reproduction and growth, the nervous system, sense organs and behaviour.

The text is illustrated by a few original schematic diagrams and there are numerous references to recent papers and reviews on the subject.

Wigglesworth deals with a difficult subject in a clear and interesting manner and the book should be of value to students and workers in both entomology and biology. In addition, the printing is clear and the book is good value for the price asked.—J. S. STEWARD.

ROBSON, J. M. [M.D., B.Sc. (Leeds). F.R.S.E., Beit Memorial Research Fellow, Institute of Animal Genetics, University of Edinburgh]. (1934). **Recent Advances in Sex and Reproductive Physiology.** pp. x+249. 47 figs. [Numerous refs.] London : J. & A. Churchill. [8vo] [12s. 6d.]

During recent years, the outlook on questions dealing with sexual physiology has suddenly expanded to an enormous extent. This has been largely due to the discovery of the numerous sex hormones which are now known to play such a large part in initiating and regulating the reproductive processes. The clinician is naturally tempted to look for a practical application of these recent discoveries, and the author has written this book so that the facts should be available in a convenient form. The book deals mainly with the sexual cycle of the human female, and most attention has been paid to the activities of the female sex hormones. A short description is given of the morphological changes which occur in the uterus and other sex organs, and the alterations which take place in the uterine muscle and its response to oxytocin, and other drugs, at various stages of the sexual cycle. Attention is next paid to the isolation, preparation and activity of the various hormones and, whilst no fresh facts are brought to light, yet the author is to be congratulated on the clear manner in which he deals with this complicated subject. In a short chapter on the rate of production of the various hormones, it is pointed out that there is no evidence to show whether the sex hormones are quantitatively excreted, or whether they are in part destroyed by the body. The book concludes with a consideration of the clinical uses to which the new knowledge may be put. From the veterinary point of view, it is rather disappointing that no mention is made of the Allen-Doisy test, nor does it appear that new therapeutic measures can be developed until much further work has been undertaken.—J. A. NICHOLSON.